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U. S. DEPARTMENT OF THE INTERIOR
PROTOTYPE OIL SHALE LEASING PROGRAM

OIL SHALE TRACT C-b
DEVELOPMENT MONITORING REPORT #5

(June 1980 through November 1980)

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Submitted to:

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U. S. Geological Survey
Grand Junction, Colorado

By:

CATHEDRAL BLUFFS SHALE OIL COMPANY

TENNECO SHALE OIL COMPANY
OCCIDENTAL OIL SHALE, INC., OPERATOR

January 15, 1981

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INTRODUCTION

Regular environmental reporting for Oil Shale Tract C-b in the current phase called Development Monitoring consists of the following reports:

REPORT	SUBMITTAL DATE
Six-Month Data Reports	January 15 July 15
Annual Report	April

Development Monitoring was initiated in April, 1978. Following is a list of semi-annual data reports which have been submitted to the Deputy Conservation Manager - Oil Shale.

Report #	Date Submitted	Period of Data
Development Monitoring Report #1	January 15, 1979	April 1978 - September 1978.
Development Monitoring #2	July 15, 1979	October 1978 - April 1979.
Time Series Plots	August 15, 1979	October 1978 - April 1979.
Development Monitoring #3	January 15, 1980	May 1979 - October 1979
Time Series Plots	February 1980	May 1979 - October 1979
Development Monitoring #4	July 15, 1980	November 1979 - May 1980
Time Series Plots	August 1980	November 1979 - May 1980

This present report, Development Monitoring Report #5, contains data from June 1980 through November 1980. The time series plots will be presented as a supplemental report for this reporting period, expected to follow this report in approximately one month.

In order to maintain accuracy in the data base and reports, for errors that are found requiring corrections from previously reported data, the following actions have been taken:

1) Summary tables in this report and the C-b computerized data base reflect corrected data to the best of our knowledge.

2) Cross-reference tables to data corrections and data corrections from the preceeding data report appear in this report.

3) Cumulative correction cross-reference tables are included in this report and the data corrections will appear in the next data report.

2.5 Biology

Studies required by the Developmental Monitoring plan are contained in this section and are listed in the table of contents.

Monitoring stations referenced in this section are located on Figure 2.5-1, Biological Development Monitoring Program.

All monitoring stations are referenced by four-digit computer station codes. A cross-reference of the computer codes and station ID appear in section 4.0 (Data Automation).

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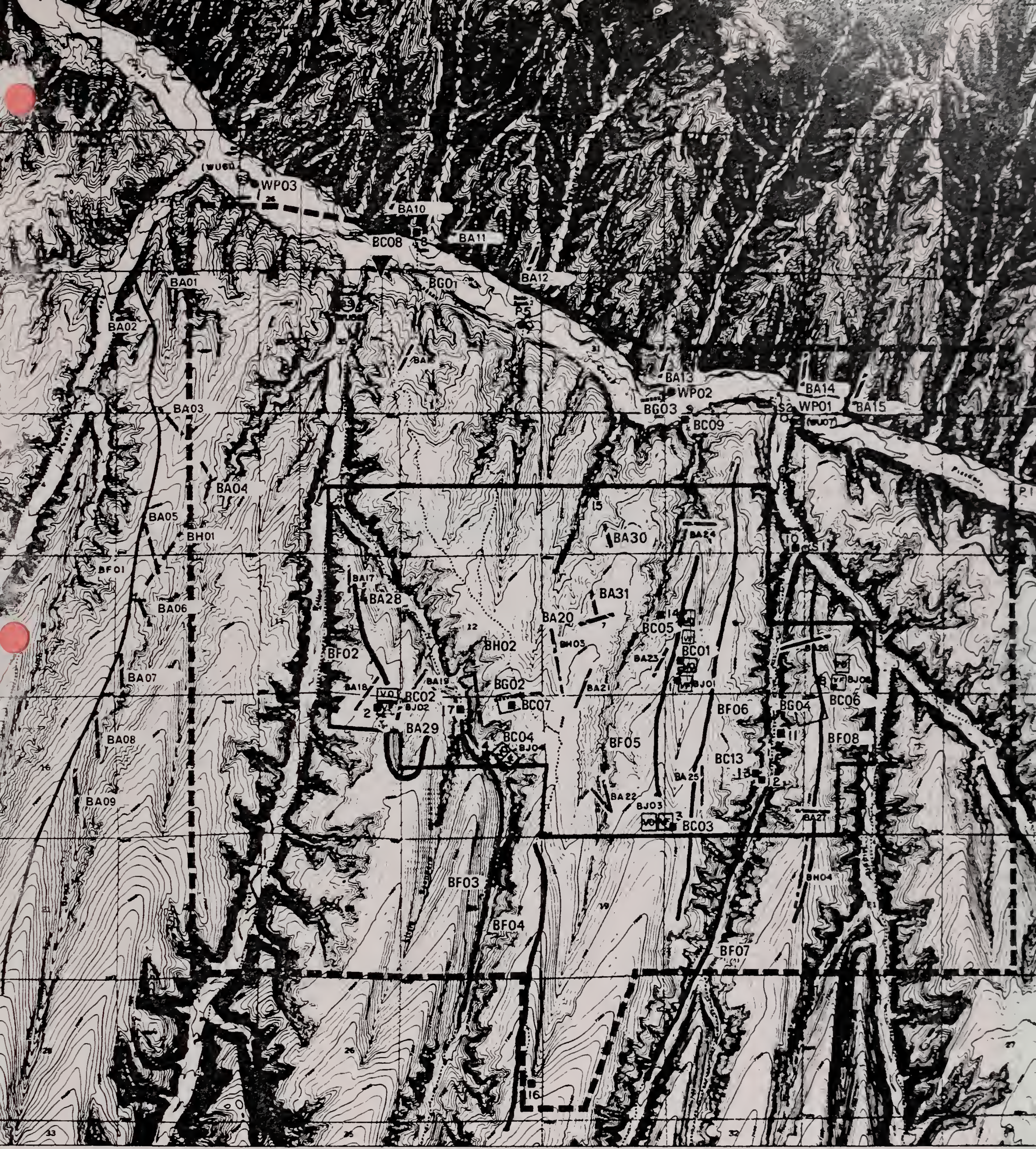

Ⓖⓢ Water Gaging Station - Benthos

VO / VF Vegetation Site: VO = Open (50 x 70 m) VF = Fenced (50 x 70 m)

■ Microenvironmental Station

○ Fish Sampling

● Periphyton

Animal Trap Site

Deer Pellet and Browse Utilization Transects

Ornithological Gamebird Study Transects

Predator Survey Lines

▼ Other Sensitive Areas

BIOLOGICAL DEVELOPMENT MONITORING PROGRAM

Figure 2.5-1

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2.5.1 Terrestrial Wildlife Studies

Data were gathered from June 1980 through November 1980. Tabular data includes those for migrational patterns and phenology, road kills, natural mortality, browse production and utilization studies, coyote abundance, lagomorph abundance, small mammal trapping, and the raptor nesting study.

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2.5.1.1 Big Game: Mule Deer

Scope of Work

Mule deer conducted during this sample period included: road counts, road kills and mortality transects.

Methods

Pellet Group Densities

Pellet group counts were conducted along 30 permanent transects. The plots were raked in the fall and the pellet groups were counted in the spring.

Browse Production and Utilization

Production and Utilization studies of bitterbrush and mountain mahogany were conducted along 19 transects; consisting of 205 bitterbrush shrubs and 30 mountain mahogany shrubs. Methods consist of measuring lengths of current growth in the fall (10 shoots per shrub), marking main stems for relocation, and measuring what remains of the current annual growth in the spring.

Migrational Patterns and Phenology

Mule deer road counts were conducted in the same manner as during the baseline studies. The 41-mile length of Piceance Creek road was driven (from Rio Blanco Store to Highway 64) and all deer observed were recorded within one-mile intervals. All counts were made during before dusk.

Road Kills

Mule deer road kill counts were conducted along the same 41-mile length of road as the mule deer counts. The method used was described in the monitoring plan. The dead deer were aged, sexed, and tagged.

Natural Mortality

Sampling was done in the spring on 10 plots located in lateral draws and sagebrush gulches. The age and sex of all deer that died the previous winter were recorded, and each carcass is marked with a metal tag, stamped with the current year.

Results

Pellet Group Densities

Pellet group density data are presented in Table 2.5.1.1-1

Browse Production and Utilization

Browse data are shown in Tables 2.5.1.1-2 and 2.5.1.1-3. Utilization seemed to have decreased.

Table 2.5.1.1-1 Deer pellet group densities 1979-80.

Transect	Mean pellet groups per acre ± SE (n)*
Chained pinyon-juniper:	
BA17	575 ± 96.2 (20)
BA18	495 ± 80.0 (20)
BA25	745 ±106.5 (20)
BA20	470 ± 67.7 (20)
BA21	750 ±110.9 (20)
BA23	480 ± 94.5 (20)
BA01	415 ± 53.0 (20)
BA02	480 ± 78.7 (20)
BA03	310 ± 46.4 (20)
BA04	535 ± 83.1 (20)
BA05	475 ± 58.0 (20)
BA06	195 ± 33.6 (20)
BA07	155 ± 26.6 (20)
BA08	230 ± 37.8 (20)
BA09	255 ± 39.4 (20)
Pinyon-juniper woodland:	
BA19	435 ± 77.9 (20)
BA26	225 ± 36.9 (20)
BA27	390 ± 67.2 (20)
BA16	226 ± 58.7 (19)
BA22	340 ± 57.3 (20)
BA24	305 ± 50.0 (20)
BA10	355 ± 50.0 (20)
BA11	320 ± 56.0 (20)
BA12	380 ± 60.5 (20)
BA13	435 ± 77.6 (20)
BA14	790 ± 70.3 (20)
BA15	885 ±135.4 (20)

---

* n = number of 0.01 acre plots sampled

Table 2.5.1.1-2 Browse production, 1980.

Transect	PRODUCTION: length of new shoots in fall (mm) Mean ± SE (n)*
BITTERBRUSH, CHAINED RANGELAND HABITAT:	
BA17	126 ± 8.8 (10)
BA18	175 ± 17.8 (10)
BA25	149 ± 22.6 (10)
BA21	140 ± 16.6 (10)
Watered during summer 1980:	
BA20	211 ± 24.0 (10)
BA32	184 ± 13.7 (15)
Not watered; control transects:	
BA23	148 ± 17.3 (10)
BA30	146 ± 15.1 (15)
BA31	203 ± 10.3 (15)
On Big Jimmy ridge:	
BA01	137 ± 11.1 (10)
BA04	161 ± 15.9 (10)
BA06	121 ± 13.7 (10)
BA09	88 ± 12.2 (10)
BITTERBRUSH, PINYON-JUNIPER WOODLAND:	
BA19	119 ± 10.1 (10)
BA26	109 ± 10.9 (10)
BA27	107 ± 7.0 (10)
BA16	126 ± 15.9 (10)
BA22	137 ± 15.5 (10)
BA24	81 ± 9.9 (10)

---

* n = number of shrubs sampled

Table 2.5.1.1-2 Continued.

Transect	A PRODUCTION length of new shoots in fall (mm) Mean±SE (n)*	B Lengths of shoots remaining in spring (mm) Mean±SE (n)*	C UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
Mt. mahogany, chained rangeland habitat:			
BA28	150±32.9 (10)	65±17.8 (10)	57
BA17	93± 8.1 (10)	39± 8.7 (10)	58
BA29	108±12.4 (10)	56±11.3 (10)	48
		Combined	54

---

* n = number of shrubs sampled

Table 2.5.1.1-3 Browse Production and Utilization, 1979-80.

Transect	A PRODUCTION length of new shoots in fall (mm) Mean±SE (n)*	B Lengths of shoots remaining in spring (mm) Mean±SE (n)*	C UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
	Bitterbrush, chained rangeland habitat:		
Reference Area:			
BA17	162±16.7 (10)	52±10.3 (10)	68
BA18	173±11.8 (10)	51± 8.3 (10)	71
BA25	150±19.5 (10)	58±11.5 (10)	61
BA01	228±26.6 (10)	30± 3.1 (10)	87
BA04	249±25.8 (10)	42± 7.7 (10)	83
BA09	119±14.3 (10)	54± 7.1 (10)	55
			Combined 71
Developmental Area:			
BA30	189±16.1 (15)	39± 8.7 (14)	79
BA31	230±20.4 (15)	58± 8.7 (15)	75
BA32	202±20.0 (15)	32± 6.4 (15)	84
BA20	242±23.1 (10)	76±22.9 (10)	69
BA21	189±22.3 (10)	87±22.0 (10)	54
BA23	166±12.9 (10)	58±11.2 (10)	65
BA28	157±16.9 (10)	60±12.3 (10)	62
BA33	154±11.4 (15)	22± 4.1 (15)	86
			Combined 72
	Bitterbrush, pinyon-juniper habitat:		
Reference Area:			
BA19	126±15.2 (10)	70±12.0 (10)	44
BA26	133±12.7 (10)	86±14.1 (10)	35
BA27	131±16.7 (10)	45±10.2 (10)	66
			Combined 48
Developmental Area:			
BA16	145±10.2 (10)	43±11.5 (10)	70
BA22	170±22.2 (10)	96±19.1 (10)	44
BA24	107±12.2 (10)	59±11.9 (10)	45
			Combined 53

---

* n = number of shrubs sampled

Deer Counts

Mule deer road count data are presented in Table 2.5.1.1-4.

Road Kill

Road kill data are presented in Table 2.5.1.1-5.

Natural Mortality

Mule deer natural mortality results are shown in Table 2.5.1.1-6 . There was an increase in natural mortality over last year.

TABLE 2.5.1.1-4

1980 DEER COUNT

	JAN			FEB					MAR				APR				MAY			SEPT	OCT					NOV		
MILE	3	17	24	1	7	14	21	28	6	13	20	26	3	10	17	24	1	8	15	25	2	9	16	23	30	6	13	20
00						6									13						27		5		5			
01			8	9					9	1	7		5		8													
02			4	6	5				4	3		18	5									1						
03									6		5		18		2													
04				9		1	5		3	21	9	9	40															
05								5	6	2	10		29		16									2			3	
06			3	5				12	23	51	40	9	47	1	14													
07			9			3		8	36	29	62	27	33	3	17													
08			4		1			2	2	1	4	12	33	7	17													
09			10	4	2			8	8	13	40	33	45	2	28										3			
10	12		12	9	14	3			15	10	12	16	29	24	46										7			6
11			3	3					17	20	24	12	45	18	52	33									4			
12			16	12	15		13	8	30	73	22	49	73	31	84	90	36											
13			9	8	8		5	25	22	29	33	20	36	38	42	13								3		2	8	2
14			6	1			2	24		38	9	23	11	13	27	49	15						6	3		8	2	
15					12	3		12		4	25	29	12		44	4	4						7					
16			3	5		2	8	3	16	40	36		14	31	38	6							10	15				7
17	4	1				2	2	8	9	8	13	2	40	27	42	33	7						25	8	1		2	
18	6		5	9	10	1	7	25		31	30	5	29	62	32	29	19					6	45	81	28	5		
19			5	4		1	2	3		23	32	1	44	68	94	74	11				3		4	2			1	
20			4	4			4	2		5	5	6	3	13	19	12	36	25					8	58	8	5	12	2
21	2		28	6	6			5			10	15	7	18	33	20	2		2				3	4				5
22			19	13	9	6	4	66	9	110	107	45	121	97	155	106	60	39	5								10	
23	6			25		1	2	8	5	40	33	50	64	4				11	3					4	2			
24			7	7	3		6	6	2	6	12		25	5	71	37	5	4	3					29	4			
25			11	6	4			27	2		43	14	50	53	59	70		8										
26			4	12				8					30		2	22												2
27			4	4		8		4		20	10	16	22	83		49	24	22										
28		5	10	9			2	4	6	2	20	25	25	77	46	53	15	2										3
29			14	1		6		15	2	23	5	52	44	36	28	38	4							2				
30		3	13	19		8		2	12	46	17	87	82	135	182	43	11							13				
31		1	2	5		12		13		101	63	89	131	199	149	159	20	29						48				5
32								12		7		10	22	41		59		7										
33		7								5		24	22	45	32	37	8							6				
34				2						18		29	25	32		21												
35	1					6				21				26		19												
36				2								3		8		3												
37		2	3	8		8		14	4	6		4		20														
38	7	1	1	7		3		7	1	10	2	5	1											1				
39	2		7					2	3	13		25		17		14		3										
40														55		103	5	45	11				6	28	1		11	6
41												21	15	28	17	9						4		4	2			3
TOTAL	40	20	224	214	89	80	62	338	252	830	740	785	1277	1317	1409	1205	282	195	24		30	11	119	311	65	20	49	41

1980 DEER KILL

Table 2.5.1.1-5

	JAN			FEB					MAR				APR.				MAY			SEP				OCT					NOV			
MILE	3	17	24	1	7	14	21	28	6	13	20	26	3	10	17	24	1	8	15	1	8	15	25	2	9	16	23	30	6	14	20	26
00																																
01																																
02											1																					
03										1																						
04																																
05																																
06						1				1	1													1								
07										2		1		1																		
08										2	1	1	1	1	1																	
09						1		3		1					1												1					
10						1		2	1		1	1	2																			
11										1	1			2		1																
12										1		2	1		1																	
13								1	1				1																1			
14						1				1							1	1													1	
15													1	1				1											1			
16								1							1	1																
17					1				2			1																				
18				1																								1				
19						1						1					1		1													
20													1			1											1					
21					1								1		1	2											1					
22																																
23				1							2																					
24					1																											
25															1																	
26															1																1	
27																																
28																														1		
29																																
30						1					1																	1				
31				1											1			1														
32				1		2																										
33																												1				
34													1																			
35																																
36																														1		
37																												1		1		1
38																																
39																																
40																																
41																																
TOTAL				4	3	8		7	4	10	8	7	9	5	8	5	2	3	1					1			3	4	2	3	2	1

Table 2.5.1.1-6 Results of deer mortality studies.

Year	Sampling Location	No. of carcasses found	Hectares sampled (acres)	Carcasses per hectare (/acre)
1979-80	Sagebrush-lateral draw	60	70.5(174)	0.85 (0.35)
1978-79	Sagebrush-lateral draw	34	70.5(174)	0.482(0.195)
1977-78	Sagebrush-lateral draw	25	70.5(174)	0.355(0.144)
1976-77	Interim monitoring period - No sampling			
1975-76	Lateral draws	8	7.25(18)	1.10 (0.44)
1974-75	Lateral draws	11	7.25(18)	1.52 (0.61)

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2.5.1.2 Medium-Sized Mammals

Scope of Work

Medium-sized mammal studies consist of coyote and lagomorph (cottontails and jackrabbits) abundance.

Methods

Coyote Abundance

Coyote abundance was calculated using data collected in October from 30 miles of scent posts (based on U.S. Fish and Wildlife Service design); set one day and collected the following day.

Lagomorph Abundance

Lagomorph pellet counts are colelcted along the same transects used for deer pellet group densities. Plot size is .001 acre; plots are checked in the spring and the fall.

Results

Coyote Abundance

Coyote abundance data are presented in Table 2.5.1.2-1.

Lagomorph Abundance

Lagomorph abundance data are presented in Table 2.5.1.2-2.

Table 2.5.1.2-1 Results of the coyote scent station survey, 1980.

Line	Location	No. of Stations	No. of Visits
1	Big Jimmy	25	2
2	Scandard ridge	10	0
3	Scandard Gulch	10	1
4	SG-15	10	0
5	SG-3	10	0
6	Stewart ridge	15	1
7	West Stewart valley	10	1
8	Baily Ridge	10	0

$$\text{Index of abundance} = \frac{\text{No. of visits}}{\text{No. of stations}} \times 1000$$

$$= \frac{5}{100} \times 1000 = 50$$

Table 2.5.1.2-2 Relative abundance of cottontails and jackrabbits, 1979-80. Each transect consists of twenty 0.001 acre plots.

Transects	No. of plots with lagomorph droppings
Chained habitat:	
BA01	15
BA02	12
BA03	16
BA04	6
BA05	13
BA06	12
BA07	12
BA08	11
BA09	10
BA17	14
BA18	19
BA25	12
BA20	8
BA21	8
BA23	12
Pinyon-juniper habitat:	
BA10	12
BA11	15
BA12	14
BA13	8
BA14	6
BA15	2
BA16	19
BA19	13
BA22	10
BA24	10
BA26	14
BA27	14

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2.5.1.3 Small Mammals

Scope of Work

Small mammal studies consist of obtaining information on relative abundance, species composition, reproductive condition, and age-class.

Methods

Samll mammal trapping was conducted in June and August on control and developmental plots in the chained pinyon-juniper habitat type. Areas within the sprinkler system were compared to controls outside the sprinkler area. The control plot BG04 for pinyon-juniper was also sampled. Trapping occurred for three consecutive nights (ommitting rainy nights); after each night, all traps were moved to an adjacent trap location. Each night 500 traps were set. Figure 2.5.1.3-1 presents the location of the sprinkler system on Tract C-b.

Results.

Relative abundance data for small mammals are presented in Table 2.5.1.3-1.

Table 2.5.1.3-1 Relative abundance of small mammals, 1980[1]. Data compare watered areas in the chained rangeland habitat with control areas in chained and pinyon-juniper habitat.

	Chained Rangeland Habitat						Pinyon-Juniper Habitat	
	Least Water		Most Water		Control		Control	
	JUL (300)[2]	AUG (300)	JUL (300)	AUG (120)	JUL (600)	AUG (600)	JUL (150)	AUG (150)
Deer Mouse *Peromyscus maniculatus*	20.3	15.3	16.3	11.7	26.8	27.8	34.7	23.3
Least Chipmunk *Eutamias minimus*	7.3	28.7	6.7	24.2	13.5	19.7	0.7	1.3
Uinta Chipmunk *Eutamias umbrinus*	0	0	0	0	0	0	5.3	11.3
Golden-mantled ground squirrel *Spermophilus lateralis*	10.7	4.0	10.7	8.3	4.7	0.7	4.0	0
Apache Pocket Mouse *Perognathus apache*	0	0	0	0	0.2	0	0	0

---

[1] Relative abundance = number of captures / 100 traps.

[2] Number of trap-nights (a trap-night is one trap set one night).

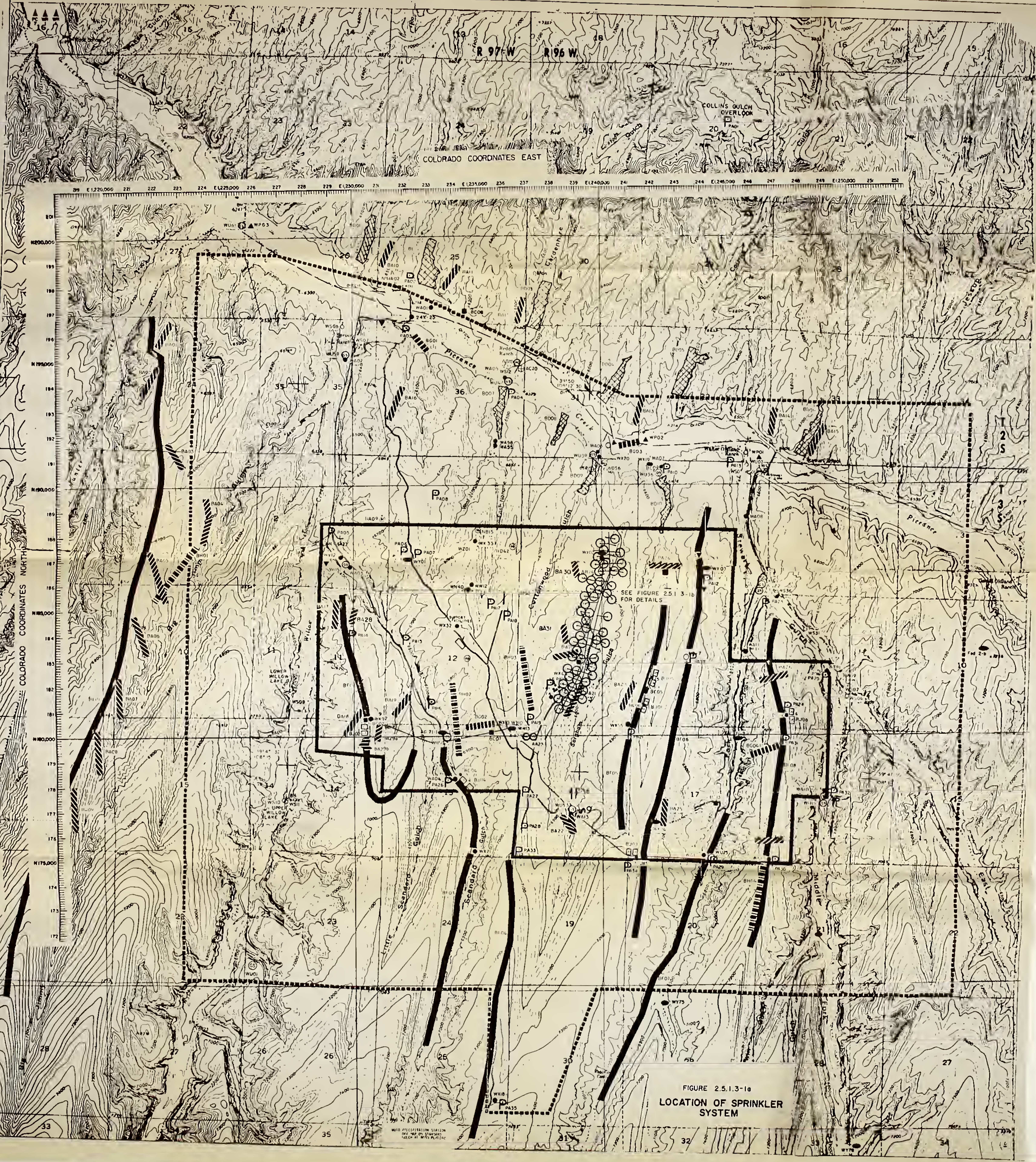

FIGURE 2.5.1.3-1a

LOCATION OF SPRINKLER SYSTEM

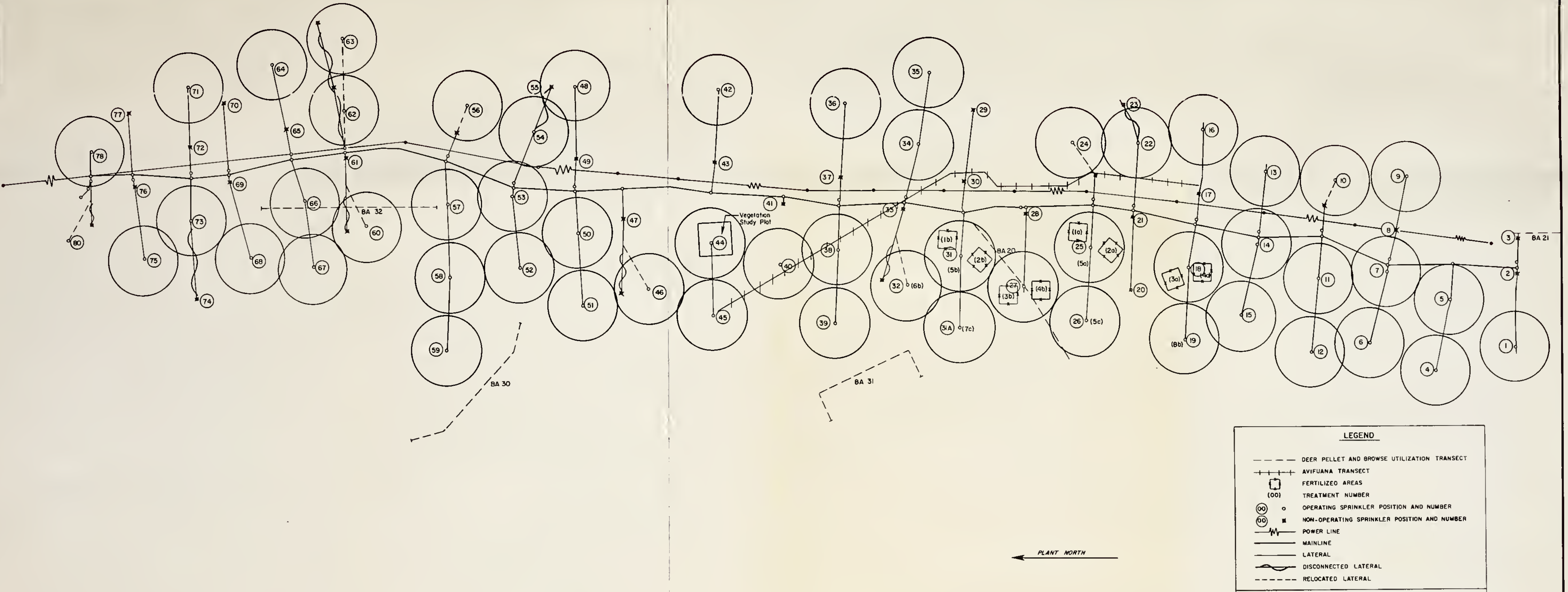

FIGURE 2.5.1.3-1b
C-b SHALE OIL VENTURE
SPRINKLER SYSTEM
UNIT B

DRAWN BY: Vicki Smith
SCALE 1" = 200'

2.5.1.4 Avifauna

Introduction

No additional avifauna studies on songbirds or gamebirds were conducted during this period. Raptor nest censusing for 1980 was conducted in April and June.

Scope of Work

Fifty-one raptor nests were checked for nesting activity.

Methods

Nests were found using photographs and topographic maps of their locations. Observations were made using a spotting scope from a safe distance (50 meters or more) so as not to disturb possible nesting activity. Any new or undocumented nests were photographed and recorded. Where there was no observed activity, closed examination of the nest was made to look for fresh pellets, whitewash or green material.

Results

The results from the 1980 raptor nest censusing is presented in Table 2.5.1.4-1. Eight nests had signs of activity.

TABLE 2.5.1.4-1 RAPTOR NESTING RECORD

Nest No.	Species	Status 1976		Status 1977		Status 1978		Status 1979		Status 1980	
		April	June	April	June	April	June	April	June	April	June
1	Unknown	I		I	I	I	I	I	I	I	I
2	Unknown	I		I	I	I	I	I	I	I	I
3	Unknown	I		I	I	I	I	I	I	I	I
4	Red-tailed Hawk	E or Y		I	I	I	I	I	I	I	I
5	Unknown	I		I	I	I	I	I	I	I	I
5a	Common Raven	-		-	E or Y	I	I	I	I	I	I
6	Golden Eagle	E		I	2Y	I	I	E or Y	I	1Y	1Y
7	Red-tailed Hawk	I		I	-	E	I	E or Y	I	E or Y	1Y
8	Red-tailed Hawk	4Y		I	I	E	I	E or Y	I	I	I
9	Common Raven	I		I	I	I	I	I	I	E	2Y
10	Red-tailed Hawk	I		I	I	I	I	I	I	I	I
11	Nest Gone										
12	Red-tailed Hawk	I		I	I	E	1Y	I	I	I	I
13	Red-tailed Hawk	I		I	I	I	I	E or Y	I	I	I
14	Unknown	I		I	I	I	I	I	I	I	I
15	Unknown	I		I	I	I	I	I	I	I	I
16	Great Horned Owl	I		I	I	E	2Y	I	I	I	I
17	Great Horned Owl	I		I	I	I	I	I	I	I	I
18	Red-tailed Hawk	I		I	I	I	I	1Y	I(GHO)	I	I
19	Great Horned Owl	1Y		I	I	I	I	I	I	I	I
20	Unknown							I	I	Packrats	
21	Not on map										
22	Red-tailed Hawk	I		I	I	I	I	E or Y	I	I	2Y
23	Not on map										
24	Red-tailed Hawk	I		I	I	I	I	I	I	Packrats	
25	Great Horned Owl	I		I	I	I	I	I	I	Packrats	
26	Unknown	I		I	I	I	I			Nest Gone	
27	Red-tailed Hawk	I		I	I	I	I	E or Y	I	I	I
28	Golden Eagle	1Y		I	I	I	I	I	I	I	I
29	Unknown	I		I	I	I	I	I	I	I	I
30	Red-tailed Hawk	2Y		I	I	I	I	I	I	I	I
31	Unknown	I		I	I	I	I	I	I	I	I
32	Great Horned Owl	2Y		2Y	-	I	I	I	I	I	I
33	Unknown	I		I	I	I	I	I	I	I	I
34	Unknown	I		I	I	I	I	I	I	I	I
35	Unknown	I		I	I	I	I	I	I	I	I
36	Red-tailed Hawk	2Y		I	I	I	I	E	2Y	I	2Y
37	Unknown	I		I	I	I	I	I	I	I	I
38	Raven	I		I	I	I	I	E or Y	Y	I	E or Y
39	Golden Eagle	1Y		I	I	I	I	I	I	I	I
40	Great Horned Owl	I		I	I	E	2Y	2Y	I	I	I
41	Unknown	I		I	I	I	I			Nest Gone	
42	Unknown	I		I	I	I	I	I	I	I	I
42a	Red-tailed Hawk	-		-	2Y	I	I	E or Y	I(GHO)	I	I
43	Great Horned Owl	2Y		I	I	I	I	I	I	I	I
44	Unknown	I		I	I	I	I	I	I	I	I
45	Red-tailed Hawk	2Y		I	I	I	I	E	2Y	I	2Y
46	Red-tailed Hawk					E	I	E or Y	I	I	I
47	Unknown					I		I	I	I	I
48	Great Horned Owl							E	I	I	I
49	Magpie									I	I
50	Red-tailed Hawk									I	1Y
51	Unknown									I	I

Code:

I = inactive nest
E = adult bird observed in an incubating posture; presumed to be incubating eggs.
(2) Y = number of young observed in the nest.
E or Y - adult bird observed in an incubating posture; due to time of year, assumed to be either incubating eggs or brooding very young chicks.

2.5.2 Aquatic Studies

Introduction

Aquatic sampling was conducted from May 1980 through November 1, 1980.

Scope of Work

Aquatic studies for this period consisted of: periphyton and benthos sampling.

Methods

Benthos

Benthic macroinvertebrate sampling stations located in Piceance Creek (Figure 2.5.2-1) are the same as the current periphyton collection stations. Six collections were obtained at approximately one month intervals between May and October, 1980. C.B. staff biologists used a standard Surber sampler to provide three replicates from each station per sampling date. Each replicate was placed in a labeled container, preserved with 10% formalin on site, and mailed to Mariah Associates' Aquatics Laboratory in Laramie, Wyoming for further processing and analysis.

Upon arrival, the samples are washed over a fine mesh sieve (U.S. NO. 60). Organisms are separated from debris and placed in vials of 80% ethyl alcohol. Identification and enumeration are accomplished with the aid of a Bausch and Lomb Stereo Zoom 7 (5x-210x) dissecting microscope. Whole oligochaete and chironomid head capsules are mounted in Hoyers cleaning and mounting medium and identified with the use of a Wild Heerbrugg microscope at a magnification of 200x or 400x.

Periphyton

The 1980 periphyton sampling stations (Figure 2.5.2-1) located in Piceance Creek are identified as WP01 (Stewart Gulch near USGS Station WU07), WP02 (Middle Station) and WP03 (Hunter Creek near USGS Station WU61). Station WP01 was moved in 1977 from a baseline location of P-1 farther upstream, to its current position as a control station above development impact. Table 8.6.2-1 in the C. B. 1979 Annual Report provides a cross reference to the station codes.

Periphyton is collected from artificial substrates (glass slides) at each station during every sampling period. The glass slides are incubated in the water for at least 21 days. Nine slides are collected from each station, placed in individual cytomailers and preserved with 4% formalin. Three of the nine slides are used for taxonomic identification and enumeration, three for biomass determinations and three are extra slides in case any of the others become damaged.

The cytomailers are sent to Mariah Associates' Aquatics Laboratory in Laramie, Wyoming. All field procedures are executed by C.B. personnel.

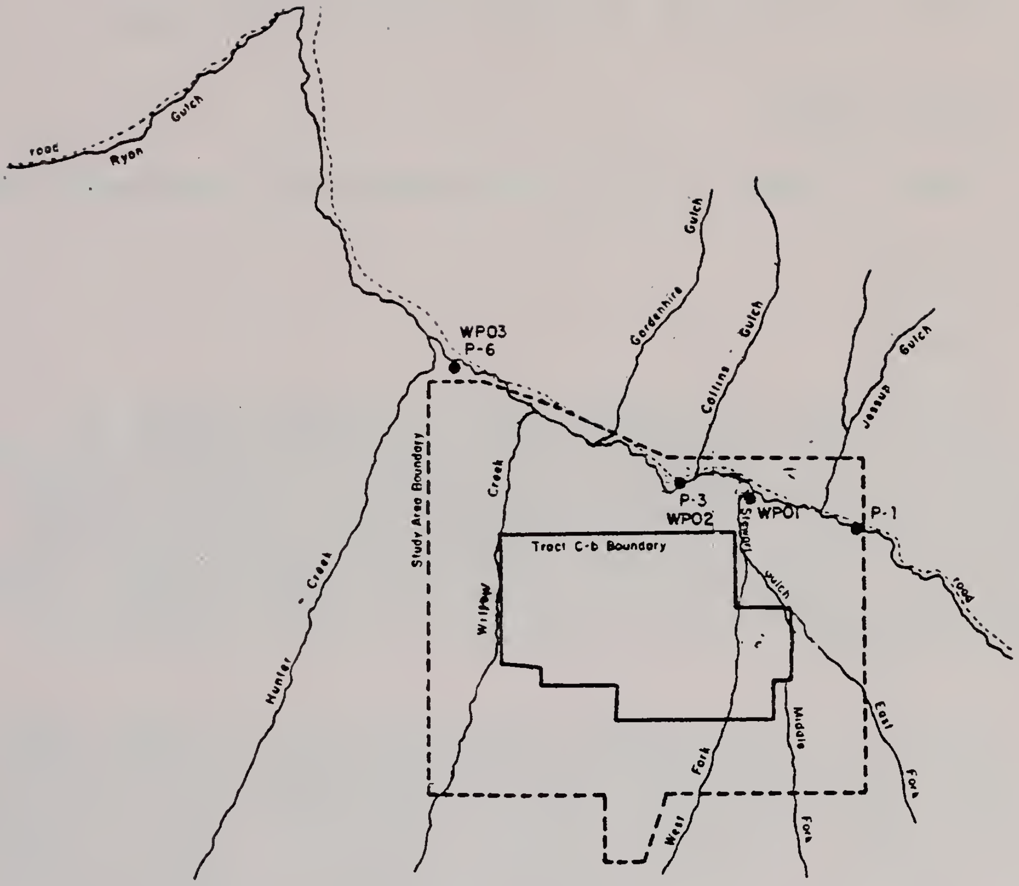

Figure 2.5.2-1

PERIPHYTON SAMPLING STATIONS

Five collections were obtained during the period of June through October 1980. A different type of slide holder was initiated into the program on July 2, 1980. The original type was also retained in order to compare the results from both kinds. Nine slides from each periphytometer were collected on August 1, 1980 and for the remainder of the 1980 study period. Biomass determinations and periphyton taxonomic identification and enumeration were performed on the August 1, 1980 collections. Only biomass determinations were performed on the collections from the old sampler for the remainder of the year.

Upon arrival, the biomass is removed from the slides with a razor blade, and the scrapings placed in separate crucibles to be dehydrated in a drying oven at 105 to 110°C. Samples are then cooled to room temperature in a dessicator and weighed to the nearest 0.0001 g (gross dry weight). After ashing in a muffle furnace at 450°C for approximately four hours, the samples are rewet upon cooling to replace their water of hydration, redried to a constant weight at 105 to 110°C and weighed to the nearest 0.0001 g (gross ash weight). Ash-free dry weight is obtained by subtracting gross ash weight from gross dry weight since the evaporating dish tare is assumed to be identical for the two weights.

Ash-free dry weight biomass is calculated according to the following equation:

$$\text{biomass } (\text{mg/cm}^2) = \frac{Wd - Wa}{As}$$

where: Wd = dry weight plus tare, mg
Wa = ash weight plus tare, mg
As = area scraped from slide, cm^2

Algae other than diatoms are identified directly from the slides with 200x or 400x magnification. The periphyton are then scraped from each slide with a razor blade and placed into separate jars. The contents of each jar is identified according to species composition and relative abundance.

Benthos and Periphyton data and their species lists are presented in the following pages:

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Species Occurrence - Station 2 III-134

Station 3 - Hunter Station (WP03) III-137
Species Occurrence - Station 3 III-138

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RAW BENTHOS DATA

- Station 1 = Stewart Station (WP01)
- Station 2 = Middle Station (WP02)
- Station 3 = Hunter Station (WP03)

- May
- June
- August
- September (9/02/80)
- September (9/29/80)
- October

MAY

```
BENTHOS DATA SHEET
------------------

CATHEDRAL BLUFFS SHALE OIL COMPANY

 STATION NO. - 1         LOG NUMBER - (1-3)-132
 SAMPLE DATE - 051980      SAMPLES COLLECTED BY - MA      NO. OF REPLICATES - 3
 ANALYSIS DATE - 060780        SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - STEWART STATION
 SAMPLE AREA - .09  M2

--------------------------------------------------------------------------------

CODE   TAXON                                      REPLICATE DESIGNATION
                                                       A      B      C
--------------------------------------------------------------------------------

TIPS   HEXATOMA   LATRETILLE                           1      0      0
BRYC   BRYCHIUS THOMSON                                1      0      0
TUBT   TUBIFEX TUBIFEX                                 0      1      0
EPIN   EPHEMERELLA INERMIS   EATON                     2      0      1
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------




 STATION NO. - 2         LOG NUMBER - (4-6)-132
 SAMPLE DATE - 051980      SAMPLES COLLECTED BY - MA      NO. OF REPLICATES - 3
 ANALYSIS DATE - 060780        SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - MIDDLE STATION
 SAMPLE AREA - .09  M2

--------------------------------------------------------------------------------

CODE   TAXON                                      REPLICATE DESIGNATION
                                                       A      B      C
--------------------------------------------------------------------------------

TUBT   TUBIFEX TUBIFEX                                 8      0      0
TIPS   HEXATOMA   LATRETILLE                           1      0      0
EPIN   EPHEMERELLA INERMIS   EATON                     2      1      0
LYMN   LYMNAEA                                         1      0      1
LUMB   FAMILY LUMBRICULIDAE                            1      0      0
BAIN   BAETIS INSIGNIFICANS   MCDONNOUGH               0      0      1
OPTI   OPTIOSERVUS                                     0      2      0
EUPA   EUPARYPHUS                                      0      1      0
GLSO   GLOSSOSOMA   CURTIS                             0      0      1
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
```

```
 STATION NO. - 3          LOG NUMBER - (7-9)-132
 SAMPLE DATE - 051980       SAMPLES COLLECTED BY - MA      NO. OF REPLICATES - 3
 ANALYSIS DATE - 060780         SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - HUNTER STATION
 SAMPLE AREA - .09  M2

--------------------------------------------------------------------------------

CODE   TAXON                                         REPLICATE DESIGNATION
                                                         A     B     C
--------------------------------------------------------------------------------



TUBT   TUBIFEX TUBIFEX                                   5     3    40
EPIN   EPHEMERELLA INERMIS   EATON                       3     2     0
BAIN   BAETIS INSIGNIFICANS   MCDONNOUGH                 0     1     0
OPTI   OPTIOSERVUS                                       1     0     0
LIMH   LIMNODRILUS   HOFFMEISTERI                       36    29   380

--------------------------------------------------------------------------------
```

JUNE

```
BENTHOS DATA SHEET
------------------

CATHEDRAL BLUFFS SHALE OIL COMPANY

 STATION NO. - 1          LOG NUMBER - (10-12)-132
 SAMPLE DATE - 062780      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - 070980        SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - STEWART STATION
 SAMPLE AREA - .09  M2

-------------------------------------------------------------------------------

CODE   TAXON                                        REPLICATE DESIGNATION
                                                        A      B      C
-------------------------------------------------------------------------------

EPIN   EPHEMERELLA INERMIS   EATON                     25     33      0
HYSP   HYDROPSYCHE   PICTET                             1      2      2
COLL   ORDER COLLEMBOLA                                 0      0      1
HESP   HESPEROPHYLAX   BANKS                            1      0      1
OPTI   OPTIOSERVUS                                      1      2      0
TIPA   TIPULA   LINNAEUS                                1      3      0
TIPS   HEXATOMA   LATRETILLE                            2      7      2
LIMH   LIMNODRILUS   HOFFMEISTERI                       2      1      0
ISOP   ISOPERLA   BANKS                                 1      0      1
TUBT   TUBIFEX TUBIFEX                                  0      6      4
PUPA   CHIRONOMIDAE PUPAE                               0      1      0
BRYC   BRYCHIUS THOMSON                                 0      1      0
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```

```
 STATION NO. - 2        LOG NUMBER - (13-15)-132
 SAMPLE DATE - 062780      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - 070980        SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - MIDDLE STATION
 SAMPLE AREA - .09  M2

--------------------------------------------------------------------------------

CODE   TAXON                                        REPLICATE DESIGNATION
                                                        A      B      C
--------------------------------------------------------------------------------

COLL   ORDER COLLEMBOLA                                 1      0      0
NEMA   PHYLUM NEMATODA                                  1      0      0
RHEO   RHEOTANYTARSUS   BAIUSE                          1      1      0
DIAM   DIAMESA  MEIGEN                                 10     99     89
PUPA   CHIRONOMIDAE PUPAE                               1      4      6
TIPS   HEXATOMA   LATRETILLE                            0      1      3
TUBT   TUBIFEX TUBIFEX                                  0      1      4
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------


 STATION NO. - 3        LOG NUMBER - (16-18)-132
 SAMPLE DATE - 062780      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - 070780        SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - HUNTER STATION
 SAMPLE AREA - .09  M2


--------------------------------------------------------------------------------

CODE   TAXON                                        REPLICATE DESIGNATION
                                                        A      B      C
--------------------------------------------------------------------------------

HESP   HESPEROPHYLAX   BANKS                            1      0      0
TRIC   TRICORYTHODES   ULMER                            1      0      0
OPTI   OPTIOSERVUS                                      1      0      0
TUBT   TUBIFEX TUBIFEX                                  7      4      3
BAIN   BAETIS INSIGNIFICANS   MCDONNOUGH                0      1      0
DIAM   DIAMESA  MEIGEN                                  0      5      0
TIPS   HEXATOMA   LATRETILLE                            0      0      4
EPIN   EPHEMERELLA INERMIS   EATON                      0      0      1
ORTH   ORTHOCLADIUS  VAN DER WULP                       0      0      1
AGAB   AGABUS   LEACH                                   0      0      1

--------------------------------------------------------------------------------
```

AUGUST

```
BENTHOS DATA SHEET
------------------

CATHEDRAL BLUFFS SHALE OIL COMPANY

 STATION NO. - 1        LOG NUMBER - (55-57)-132
 SAMPLE DATE - 080180      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - 080880       SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - STEWART STATION
 SAMPLE AREA - .09  M2

-------------------------------------------------------------------------------

CODE   TAXON                                          REPLICATE DESIGNATION
                                                          A      B      C
-------------------------------------------------------------------------------

TIPA   TIPULA   LINNAEUS                                  1      0      2
OPTI   OPTIOSERVUS                                        0      0      1
TIPS   HEXATOMA   LATRETILLE                              5      1      1
DIAM   DIAMESA  MEIGEN                                   26     25      7
EPIN   EPHEMERELLA INERMIS   EATON                        1      0      1
BAIN   BAETIS INSIGNIFICANS   MCDONNOUGH                  1      0      2
BATR   BAETIS TRICAUDATUS   DODDS                         1      0      0
PUPA   CHIRONOMIDAE PUPAE                                 8      1      6
TUBT   TUBIFEX TUBIFEX                                    1      1      0
LIMH   LIMNODRILUS   HOFFMEISTERI                         8      2      1
ORTH   ORTHOCLADIUS  VAN DER WULP                         0      2      0
SIMU   SIMULIUM LARVAE                                    0      0      3
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```

```
 STATION NO. - 2        LOG NUMBER - (58-60)-132
 SAMPLE DATE - 080180      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - 081080        SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - MIDDLE STATION
 SAMPLE AREA - .09  M2

-----------------------------------------------------------------------------------

CODE   TAXON                                         REPLICATE DESIGNATION
                                                          A      B      C
-----------------------------------------------------------------------------------

TURT   TUBIFEX TUBIFEX                                   30     70      7
LIMH   LIMNODRILUS   HOFFMEISTERI                         5      5      8
TRIB   TRIBELOS                                          78     81     47
MICP   MICROPSECTRA  KIEFFER                              8      6     11
ORTH   ORTHOCLADIUS  VAN DER WULP                        30     33     27
PUPA   CHIRONOMIDAE PUPAE                                16      3     12
-----------------------------------------------------------------------------------
-----------------------------------------------------------------------------------


 STATION NO. - 3        LOG NUMBER - (61-63)-132
 SAMPLE DATE - 080180      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - 081080        SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - HUNTER STATION
 SAMPLE AREA - .09  M2

-----------------------------------------------------------------------------------


CODE   TAXON                                         REPLICATE DESIGNATION
                                                          A      B      C
-----------------------------------------------------------------------------------

TURT   TUBIFEX TUBIFEX                                    3      5      0
LIMH   LIMNODRILUS   HOFFMEISTERI                         4     40      3
TRIB   TRIBELOS                                           1      0      0
ORTH   ORTHOCLADIUS  VAN DER WULP                         1      0      0
PUPA   CHIRONOMIDAE PUPAE                                 2      0      0

-----------------------------------------------------------------------------------
```

SEPTEMBER (9/02/80)

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BENTHOS DATA SHEET
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CATHEDRAL BLUFFS SHALE OIL COMPANY

 STATION NO. - 1         LOG NUMBER - (82-84)-132
 SAMPLE DATE - 090280      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - 091080        SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - STEWART STATION
 SAMPLE AREA - .09  M2

--------------------------------------------------------------------------------

CODE   TAXON                                             REPLICATE DESIGNATION
                                                             A      B      C
--------------------------------------------------------------------------------

BAET   BAETIS   LEACH                                       17     25      8
CRIC   CRICOTOPUS    VAN DER WULP                           15     28     14
EUKI   EUKIEFFERIELLA   THIENEMANN                           2      4      2
ORTH   ORTHOCLADIUS  VAN DER WULP                            4     27     11
TUBT   TUBIFEX TUBIFEX                                       1     83     21
NAID   FAMILY NAIDIDAE                                      10    150     43
TIPS   HEXATOMA   LATRETILLE                                 2      9      2
PUPA   CHIRONOMIDAE PUPAE                                    1      4      3
OPTI   OPTIOSERVUS                                           0      1      0
HYSP   HYDROPSYCHE   PICTET                                  0      5      3
EUPA   EUPARYPHUS                                            0      1      0
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
```

STATION NO. - 2 LOG NUMBER - (85-87)-132
SAMPLE DATE - 090280 SAMPLES COLLECTED BY - CB NO. OF REPLICATES - 3
ANALYSIS DATE - 091080 SAMPLES ANALYZED BY - HZ
SAMPLE STATION LOCATION - MIDDLE STATION
SAMPLE AREA - .09 M2

CODE	TAXON	REPLICATE DESIGNATION		
		A	B	C
BAET	BAETIS LEACH	5	10	17
CRIC	CRICOTOPUS VAN DER WULP	0	17	4
EUKI	EUKIEFFERIELLA THIENEMANN	0	7	10
ORTH	ORTHOCLADIUS VAN DER WULP	0	18	3
TUBT	TUBIFEX TUBIFEX	0	12	5
NAID	FAMILY NAIDIDAE	0	23	8
TIPS	HEXATOMA LATRETILLE	0	1	1
PUPA	CHIRONOMIDAE PUPAE	0	4	5
OPTI	OPTIOSERVUS	0	1	3
HYSP	HYDROPSYCHE PICTET	0	0	2
TRIC	TRICORYTHODES ULMER	10	3	10
SIAR	SIMULIUM ARCTICUM MALLOCH (PUPAE)	2	2	11
AGAB	AGABUS LEACH	2	0	0
TIPA	TIPULA LINNAEUS	1	0	0
HYTL	HYDROPTILA DALMAN	0	1	0
TRIB	TRIBELOS	0	9	4
SIMU	SIMULIUM LARVAE	0	4	0
LMNO	LIMNOPHORA ROBINEAU-DESVOIDY	0	0	1
EPIN	EPHEMERELLA INERMIS EATON	0	0	1

```
 STATION NO. - 3         LOG NUMBER - (88-90)132
 SAMPLE DATE - 090280      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - 091180        SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - HUNTER STATION
 SAMPLE AREA - .09  M2

-------------------------------------------------------------------------------

CODE    TAXON                                        REPLICATE DESIGNATION
                                                         A      B      C
-------------------------------------------------------------------------------

BAET    BAETIS    LEACH                                  1      1      1
CRIC    CRICOTOPUS     VAN DER WULP                      0      1      0
TUBT    TUBIFEX TUBIFEX                                  8      4      4
NAID    FAMILY NAIDIDAE                                 11      9     12
TIPS    HEXATOMA    LATRETILLE                           1      1      0
PUPA    CHIRONOMIDAE PUPAE                               0      0      2
TRIC    TRICORYTHODES    ULMER                           1      0      0
SIMU    SIMULIUM LARVAE                                  1      1      0
EPIN    EPHEMERELLA INERMIS    EATON                     0      0      1

-------------------------------------------------------------------------------
```

SEPTEMBER (9/29/80)

```
BENTHOS DATA SHEET
------------------

CATHEDRAL BLUFFS SHALE OIL COMPANY

 STATION NO. - 1        LOG NUMBER - (115-117)-132
 SAMPLE DATE - 092980      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - 100580       SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - STEWART STATION
 SAMPLE AREA - .09  M2

------------------------------------------------------------------------------

CODE   TAXON                                    REPLICATE DESIGNATION
                                                    A      B      C
------------------------------------------------------------------------------

BAET   BAETIS   LEACH                              60     50     44
EPIN   EPHEMERELLA INERMIS   EATON                  3      1      1
ISOP   ISOPERLA   BANKS                             4      5      4
HYSP   HYDROPSYCHE   PICTET                        18     33     24
TIPS   HEXATOMA   LATRETILLE                        9      7      4
NAIS   NAIS SP.                                     1      0      0
EUKI   EUKIEFFERIELLA   THIENEMANN                  1      3      3
ORTH   ORTHOCLADIUS  VAN DER WULP                   3      0      0
OPTI   OPTIOSERVUS                                  0      0      1
LMNO   LIMNOPHORA   ROBINEAU-DESVOIDY               0      0      1
EUPA   EUPARYPHUS                                   0      0      1
------------------------------------------------------------------------------
------------------------------------------------------------------------------
```

```
 STATION NO. - 2          LOG NUMBER - (118-120)-132
 SAMPLE DATE - 092980       SAMPLES COLLECTED BY - CB       NO. OF REPLICATES - 3
 ANALYSIS DATE - 100680          SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - MIDDLE STATION
 SAMPLE AREA - .09  M2

------------------------------------------------------------------------------------------

CODE   TAXON                                               REPLICATE DESIGNATION
                                                                A       B       C
------------------------------------------------------------------------------------------

EPIN   EPHEMERELLA INERMIS   EATON                              1       0       0
HYSP   HYDROPSYCHE   PICTET                                     3       0       0
ORTH   ORTHOCLADIUS  VAN DER WULP                               1       0       0
OPTI   OPTIOSERVUS                                              8       2       1
LMNO   LIMNOPHORA   ROBINEAU-DESVOIDY                           0       1       0
TRIB   TRIBELOS                                                 4       2       2
TRIC   TRICORYTHODES   ULMER                                    1       0       0
SIAR   SIMULIUM ARCTICUM  MALLOCH (PUPAE)                       3       0       0
TUBT   TUBIFEX TUBIFEX                                         98      48      23
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 STATION NO. - 3          LOG NUMBER - (121-123)-132
 SAMPLE DATE - 092980       SAMPLES COLLECTED BY - CB       NO. OF REPLICATES - 3
 ANALYSIS DATE - 100780          SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - HUNTER STATION
 SAMPLE AREA - .09  M2


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CODE   TAXON                                               REPLICATE DESIGNATION
                                                                A       B       C
------------------------------------------------------------------------------------------

BAET   BAETIS   LEACH                                          25      16      15
EPIN   EPHEMERELLA INERMIS   EATON                              4      11       8
ISOP   ISOPERLA   BANKS                                         0       1       1
HYSP   HYDROPSYCHE   PICTET                                     2       3       0
TIPS   HEXATOMA   LATREILLE                                     1       1       1
LIMH   LIMNODRILUS   HOFFMEISTERI                              41      15      23
PUPA   CHIRONOMIDAE PUPAE                                       1       1       0
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OCTOBER

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BENTHOS DATA SHEET
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CATHEDRAL BLUFFS SHALE OIL COMPANY

 STATION NO. - 1        LOG NUMBER - (150-152)-132
 SAMPLE DATE - 102980      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - NOV 1980      SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - STEWART STATION
 SAMPLE AREA - .09  M2

--------------------------------------------------------------------------------

CODE    TAXON                                        REPLICATE DESIGNATION
                                                          A      B      C
--------------------------------------------------------------------------------


CHOP    CHRYSOPS    MEIGEN                                1      0      0
TIPS    HEXATOMA    LATRETILLE                            2      3      7
BAET    BAETIS    LEACH                                   9     11      4
HYSP    HYDROPSYCHE    PICTET                             8     43     15
HESP    HESPEROPHYLAX    BANKS                            1      1      1
EPIN    EPHEMERELLA INERMIS    EATON                      3      6      0
NAIS    NAIS SP.                                          1      0      0
EUKI    EUKIEFFERIELLA    THIENEMANN                      1      2      4
ORTA    ORTHOCLADINAE A                                   1      4      3
GLSO    GLOSSOSOMA    CURTIS                              2      1      3
OPTI    OPTIOSERVUS                                       2      2      0
LMNO    LIMNOPHORA    ROBINEAU-DESVOIDY                   0      1      0
CHLO    FAMILY CHLOROPERLIDAE                             0     11      1
TIPA    TIPULA    LINNAEUS                                0      1      0
PUPA    CHIRONOMIDAE PUPAE                                0      2      1
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 STATION NO. - 2         LOG NUMBER - (153-155)-132
 SAMPLE DATE - 102980      SAMPLES COLLECTED BY - CB      NO. OF REPLICATES - 3
 ANALYSIS DATE - NOV 1980      SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - MIDDLE STATION
 SAMPLE AREA - .09  M2

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CODE   TAXON                                           REPLICATE DESIGNATION
                                                            A      B      C
---------------------------------------------------------------------------------------


TIPS   HEXATOMA   LATRETILLE                                2      1      2
BAET   BAETIS   LEACH                                      11      4      5
HESP   HESPEROPHYLAX   BANKS                                1      1      1
EPIN   EPHEMERELLA INERMIS   EATON                          0      1      0
NAIS   NAIS SP.                                            38     19     11
EUKI   EUKIEFFERIELLA   THIENEMANN                         17     27      0
ORTH   ORTHOCLADIUS  VAN DER WULP                          34     46      0
OPTI   OPTIOSERVUS                                          4      2      0
LMNO   LIMNOPHORA   ROBINEAU-DESVOIDY                       3      0      0
CHLO   FAMILY CHLOROPERLIDAE                                6      3      0
TIPA   TIPULA   LINNAEUS                                    2      3      0
PUPA   CHIRONOMIDAE PUPAE                                   0     17     13
EITE   EISENELLA TETRAEDRA                                  1      2      0
SIMU   SIMULIUM LARVAE                                      1      2      2
EUPA   EUPARYPHUS                                           1      0      0


TUBT   TUBIFEX TUBIFEX                                     14     23     16
BRYC   BRYCHIUS THOMSON                                     1      1      1
TRIB   TRIBELOS                                             2      4      0
CRIC   CRICOTOPUS    VAN DER WULP                          11      8      0
PHYS   PHYSA SP.                                            0      0      1
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 STATION NO. - 3        LOG NUMBER - (156-158)-132
 SAMPLE DATE - 102980      SAMPLES COLLECTED BY - CB     NO. OF REPLICATES - 3
 ANALYSIS DATE - NOV 1980      SAMPLES ANALYZED BY - HZ
 SAMPLE STATION LOCATION - HUNTER STATION
 SAMPLE AREA - .09  M2

-----------------------------------------------------------------------------

CODE   TAXON                                        REPLICATE DESIGNATION
                                                        A      B      C
-----------------------------------------------------------------------------

TIPS   HEXATOMA   LATREILLE                             0      0      1
BAET   BAETIS   LEACH                                   1      0      0
EPIN   EPHEMERELLA INERMIS   EATON                      2      0      1
NAIS   NAIS SP.                                         8     12      7
EUKI   EUKIEFFERIELLA   THIENEMANN                      3      0      8
ORTH   ORTHOCLADIUS  VAN DER WULP                      11      4     31
CHLO   FAMILY CHLOROPERLIDAE                            1      0      0
PUPA   CHIRONOMIDAE PUPAE                               7      0      8
TUBT   TUBIFEX TUBIFEX                                  0      0     11

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BENTHOS SPECIES LIST

- Benthos Taxa - All Stations
- Station 1 - Stewart Station (WP01)
- Station 2 - Middle Station (WP02)
- Station 3 - Hunter Station (WP03)

Benthos Taxa - All Stations

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BENTHOS SPECIES LIST
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CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B
1980

--------------------------------------------------------------------------------------
 TAXON                                                        STATION NUMBER
                                                              1      2      3
--------------------------------------------------------------------------------------
   PHYLUM NEMATODA                                                   X
   PHYLUM ANNELIDA
    CLASS OLIGOCHAETA
     ORDER HAPLOTAXIDA
       FAMILY TUBIFICIDAE
          TUBIFEX TUBIFEX                                     X      X      X
          LIMNODRILUS  HOFFMEISTERI                           X      X      X
       FAMILY LUMBRICULIDAE                                          X
          EISENELLA TETRAEDRA                                        X
       FAMILY NAIDIDAE                                        X      X      X
          NAIS SP.                                            X      X      X
   PHYLUM ARTHROPODA
    CLASS INSECTA
     ORDER COLLEMBOLA                                         X      X
     ORDER EPHEMEROPTERA
       FAMILY BAETIDAE
          BAETIS   LEACH                                      X      X      X
          BAETIS INSIGNIFICANS   MCDONNOUGH                   X      X      X
          BAETIS TRICAUDATUS   DODDS                          X
       FAMILY EPHEMERELLIDAE
          EPHEMERELLA INERMIS   EATON                         X      X      X
       FAMILY TRICORYTHIDAE
          TRICORYTHODES   ULMER                                      X      X
     ORDER PLECOPTERA
       FAMILY CHLOROPERLIDAE                                  X      X      X
       FAMILY PERLODIDAE
          ISOPERLA   BANKS                                    X             X
     ORDER COLEOPTERA
       FAMILY ELMIDAE
          OPTIOSERVUS                                         X      X      X
       FAMILY HALIPLIDAE
          BRYCHIUS THOMSON                                    X      X
       FAMILY DYTISCIDAE
          AGABUS   LEACH                                             X      X
     ORDER TRICHOPTERA
       FAMILY HYDROPSYCHIDAE
          HYDROPSYCHE   PICTET                                X      X      X
       FAMILY HYDROPTILIDAE
          HYDROPTILA   DALMAN                                        X
       FAMILY LIMNEPHILIDAE
          HESPEROPHYLAX   BANKS                               X      X      X
       FAMILY GLOSSOSOMATIDAE
          GLOSSOSOMA   CURTIS                                 X      X
     ORDER DIPTERA
       FAMILY CHIRONOMIDAE
        SUBFAMILY DIAMESINAE
         TRIBE DIAMESINI
          DIAMESA   MEIGEN                                    X      X      X
        SUBFAMILY ORTHOCLADIINAE
          ORTHOCLADINAE A                                     X
         TRIBES ORTHOCLADIINI AND METRIOCNEM
          CARDIOCLADIUS   KIEFFER
          CRICOTOPUS    VAN DER WULP                          X      X      X
          EUKIEFFERIELLA   THIENEMANN                        X       X       X
          ORTHOCLADIUS  VAN DER WULP                         X       X       X
        SUBFAMILY CHIRONOMINAE
         TRIBE CHIRONOMINI
          TRIBELOS                                                   X       X
         TRIBE TANYTARSINI
          MICROPSECTRA  KIEFFER                                      X
          RHEOTANYTARSUS   BAUSE                                     X
          CHIRONOMIDAE PUPAE                                 X       X       X
      FAMILY SIMULIDAE
          SIMULIUM ARCTICUM  MALLOCH (PUPAE)                         X
          SIMULIUM LARVAE                                    X       X       X
      FAMILY MUSCIDAE
          LIMNOPHORA   ROBINEAU-DESVOIDY                     X       X
      FAMILY TABANIDAE
          CHRYSOPS   MEIGEN                                  X
      FAMILY TIPULIDAE
          HEXATOMA   LATRETILLE                              X       X       X
          TIPULA   LINNAEUS                                  X       X
      FAMILY STRATIOMYIDAE
          EUPARYPHUS                                         X       X
  PHYLUM MOLLUSCA
   CLASS GASTROPODA
      FAMILY LYMNAEIDAE
          LYMNAEA                                                    X
      FAMILY PHYSIDAE
          PHYSA SP.                                                  X
-----------------------------------------------------------------------------------------

X = ORGANISM IDENTIFIED TO THIS TAXONOMIC LEVEL OBSERVED AT SAMPLING STATION
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Station 1 - Stewart Station (WP01)

BENTHOS SPECIES LIST

CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

SPECIES OCCURRENCE BY SAMPLING DATE AT STATION 1
1980

TAXON	MAY	JUNE	AUG	SEP1	SEP2	OCT
			SAMPLING DATE			
PHYLUM ANNELIDA						
CLASS OLIGOCHAETA						
ORDER HAPLOTAXIDA						
FAMILY TUBIFICIDAE						
TUBIFEX TUBIFEX	X	X	X	X		
LIMNODRILUS HOFFMEISTERI		X	X			
FAMILY NAIDIDAE				X		
NAIS SP.					X	X
CLASS INSECTA						
ORDER COLLEMBOLA		X				
ORDER EPHEMEROPTERA						
FAMILY BAETIDAE						
BAETIS LEACH				X	X	X
BAETIS INSIGNIFICANS MCDONNOUGH			X			
BAETIS TRICAUDATUS DODDS			X			
FAMILY EPHEMERELLIDAE						
EPHEMERELLA INERMIS EATON	X	X	X		X	X
ORDER PLECOPTERA						
FAMILY CHLOROPERLIDAE						X
FAMILY PERLODIDAE						
ISOPERLA BANKS		X			X	
ORDER COLEOPTERA						
FAMILY ELMIDAE						
OPTIOSERVUS		X	X	X	X	X
FAMILY HALIPLIDAE						
BRYCHIUS THOMSON	X	X				
ORDER TRICHOPTERA						
FAMILY HYDROPSYCHIDAE						
HYDROPSYCHE PICTET		X		X	X	X
FAMILY LIMNEPHILIDAE						
HESPEROPHYLAX BANKS		X				X
FAMILY GLOSSOSOMATIDAE						
GLOSSOSOMA CURTIS						X
ORDER DIPTERA						
FAMILY CHIRONOMIDAE						
SUBFAMILY DIAMESINAE						
TRIBE DIAMESINI						
DIAMESA MEIGEN			X			
SUBFAMILY ORTHOCLADIINAE						
ORTHOCLADIINAE A						X
TRIBES ORTHOCLADIINI AND METRIOCNEM						
CARDIOCLADIUS KIEFFER						
CRICOTOPUS VAN DER WULP				X		
EUKIEFFERIELLA THIENEMANN				X	X	X
ORTHOCLADIUS VAN DER WULP			X	X	X	
SUBFAMILY CHIRONOMINAE						
CHIRONOMIDAE PUPAE		X	X	X		X
FAMILY SIMULIIDAE						
SIMULIUM LARVAE			X			
FAMILY MUSCIDAE						
LIMNOPHORA ROBINEAU-DESVOIDY					X	X
FAMILY TABANIDAE						
CHRYSOPS MEIGEN						X
FAMILY TIPULIDAE						
HEXATOMA LATREILLE	X	X	X	X	X	X
TIPULA LINNAEUS		X	X			X
FAMILY STRATIOMYIDAE						
EUPARYPHUS				X	X	

X = ORGANISM IDENTIFIED TO THIS TAXONOMIC LEVEL OBSERVED AT SAMPLING STATION

Station 2 - Middle Station (WP02)

BENTHOS SPECIES LIST

CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

SPECIES OCCURRENCE BY SAMPLING DATE AT STATION 2
1980

	SAMPLING DATE					
TAXON	MAY	JUNE	AUG	SEP1	SEP2	OCT
PHYLUM NEMATODA		X				
PHYLUM ANNELIDA						
CLASS OLIGOCHAETA						
ORDER HAPLOTAXIDA						
FAMILY TUBIFICIDAE						
TUBIFEX TUBIFEX	X	X	X	X	X	X
LIMNODRILUS HOFFMEISTERI			X			
FAMILY LUMBRICULIDAE	X					
EISENELLA TETRAEDRA						X
FAMILY NAIDIDAE				X		
NAIS SP.						X
CLASS INSECTA						
ORDER COLLEMBOLA		X				
ORDER EPHEMEROPTERA						
FAMILY BAETIDAE						
BAETIS LEACH				X		X
BAETIS INSIGNIFICANS MCDONNOUGH	X					
FAMILY EPHEMERELLIDAE						
EPHEMERELLA INERMIS EATON	X			X	X	X
FAMILY TRICORYTHIDAE						
TRICORYTHODES ULMER				X	X	
ORDER PLECOPTERA						
FAMILY CHLOROPERLIDAE						X
ORDER COLEOPTERA						
FAMILY ELMIDAE						
OPTIOSERVUS	X			X	X	X
FAMILY HALIPLIDAE						
BRYCHIUS THOMSON						X
FAMILY DYTISCIDAE						
AGABUS LEACH				X		
ORDER TRICHOPTERA						
FAMILY HYDROPSYCHIDAE						
HYDROPSYCHE PICTET				X	X	
FAMILY HYDROPTILIDAE						
HYDROPTILA DALMAN				X		
FAMILY LIMNEPHILIDAE						
HESPEROPHYLAX BANKS						X
FAMILY GLOSSOSOMATIDAE						
GLOSSOSOMA CURTIS	X					
ORDER DIPTERA						
FAMILY CHIRONOMIDAE						
SUBFAMILY DIAMESINAE						
TRIBE DIAMESINI						
DIAMESA MEIGEN		X				
SUBFAMILY ORTHOCLADIINAE						
TRIBES ORTHOCLADIINI AND METRIOCNEM						
CRICOTOPUS VAN DER WULP				X		X
EUKIEFFERIELLA THIENEMANN				X		X
ORTHOCLADIUS VAN DER WULP			X	X	X	X
SUBFAMILY CHIRONOMINAE						
TRIBE CHIRONOMINI						

TRIBELOS			X	X	X	X
TRIBE TANYTARSINI						
MICROPSECTRA KIEFFER			X			
RHEOTANYTARSUS BAUSE		X				
CHIRONOMIDAE PUPAE		X	X	X		X
FAMILY SIMULIIDAE						
SIMULIUM ARCTICUM MALLOCH (PUPAE)				X	X	
SIMULIUM LARVAE				X		X
FAMILY MUSCIDAE						
LIMNOPHORA ROBINEAU-DESVOIDY				X	X	X
FAMILY TIPULIDAE						
HEXATOMA LATREILLE	X	X		X		X
TIPULA LINNAEUS				X		X
FAMILY STRATIOMYIDAE						
EUPARYPHUS	X					X
PHYLUM MOLLUSCA						
CLASS GASTROPODA						
FAMILY LYMNAEIDAE						
LYMNAEA	X					
FAMILY PHYSIDAE						
PHYSA SP.						X

X = ORGANISM IDENTIFIED TO THIS TAXONOMIC LEVEL OBSERVED AT SAMPLING STATION

Station 3 - Hunter Station (WP03)

BENTHOS SPECIES LIST

CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

SPECIES OCCURRENCE BY SAMPLING DATE AT STATION 3
1980

TAXON	SAMPLING DATE MAY	 JUNE	 AUG	 SEP1	 SEP2	 OCT
PHYLUM ANNELIDA						
CLASS OLIGOCHAETA						
ORDER HAPLOTAXIDA						
FAMILY TUBIFICIDAE						
TUBIFEX TUBIFEX	X	X	X	X		X
LIMNODRILUS HOFFMEISTERI	X		X		X	
FAMILY NAIDIDAE				X		
NAIS SP.						X
CLASS INSECTA						
ORDER EPHEMEROPTERA						
FAMILY BAETIDAE						
BAETIS LEACH				X	X	X
BAETIS INSIGNIFICANS MCDONNOUGH	X	X				
FAMILY EPHEMERELLIDAE						
EPHEMERELLA INERMIS EATON	X	X		X	X	X
FAMILY TRICORYTHIDAE						
TRICORYTHODES ULMER		X		X		
ORDER PLECOPTERA						
FAMILY CHLOROPERLIDAE						X
FAMILY PERLODIDAE						
ISOPERLA BANKS					X	
ORDER COLEOPTERA						
FAMILY ELMIDAE						
OPTIOSERVUS	X	X				
FAMILY DYTISCIDAE						
AGABUS LEACH		X				
ORDER TRICHOPTERA						
FAMILY HYDROPSYCHIDAE						
HYDROPSYCHE PICTET					X	
FAMILY LIMNEPHILIDAE						
HESPEROPHYLAX BANKS		X				
ORDER DIPTERA						
FAMILY CHIRONOMIDAE						
SUBFAMILY DIAMESINAE						
TRIBE DIAMESINI						
DIAMESA MEIGEN		X				
SUBFAMILY ORTHOCLADIINAE						
TRIBES ORTHOCLADIINI AND METRIOCNEM						
CRICOTOPUS VAN DER WULP				X		
EUKIEFFERIELLA THIENEMANN						X
ORTHOCLADIUS VAN DER WULP		X	X			X
SUBFAMILY CHIRONOMINAE						
TRIBE CHIRONOMINI						
TRIBELOS			X			
CHIRONOMIDAE PUPAE			X	X	X	X
FAMILY SIMULIIDAE						
SIMULIUM LARVAE				X		
FAMILY TIPULIDAE						
HEXATOMA LATREILLE		X		X	X	X

X = ORGANISM IDENTIFIED TO THIS TAXONOMIC LEVEL OBSERVED AT SAMPLING STATION

RAW PERIPHYTON DATA

- Station 1 = Stewart Station (WP01)
- Station 2 = Middle Station (WP02)
- Station 3 = Hunter Station (WP03)

- June
- August (old)
- August (new)
- September (9/02/80)
- September (9/29/80)
- October

JUNE

PERIPHYTON BENCH SHEET

CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

STATION 1 - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 062780

C - 1487 V - 23 ML DF - 1:9 L - 50 MM W - 1 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 28-132 ANALYST - RD

		NUMBER COUNTED	
TAXON CODE	TAXON	DIATOMS PROPORTIONAL COUNT	NON-DIATOMS SEDGWICK-RAFTER COUNT
1NIACI	NITZSCHIA ACICULARIS	1	
1NAHEU	NAVICULA HEUFLERI	1	
1NAPEL	NAVICULA PELLICULOSA	5	
1NIFON	NITZSCHIA FONTICOLA	13	
1NIHOL	NITZSCHIA HOLSATICA	18	
1ACAFF	ACHNANTHES AFFINIS	30	
1NASEA	NAVICULA SECRETA VAR. APICULATA	8	
1SYMIN	SYNEDRA MINUSCULA	17	
1SUOVA	SURIRELLA OVATA	6	
1NAVIR	NAVICULA VIRIDULA	104	
1SYFAS	SYNEDRA FASCICULATA	2	
1NASIX	NAVICULA SIMPLEX	1	
1FRAVA	FRAGILARIA VAUCHERIAE	35	
1NIPAL	NITZSCHIA PALEA	5	
1AMVEN	AMPHORA VENETA	1	
1PISPP	PINNULARIA SP.	1	
4PHSPP	PHORMIDIUM SP.		14
1ACMIN	ACHNANTHES MINUTISSIMA	9	
1NIDIS	NITZSCHIA DISSIPATA	4	
1NILIN	NITZSCHIA LINEARIS	1	
1SUOVL	SURIRELLA OVALIS	P	
1FRACR	FRAGILARIA CROTONENSIS	P	
1RHGIV	RHOPALODIA GIBBA	P	
1NIAPI	NITZSCHIA APICULATA	P	
1GOOLI	GOMPHONEMA OLIVACEUM	P	
1HAMAM	HANTZSCHIA AMPHIOXYS	P	
1NIDEN	NITZSCHIA DENTICULA	P	
1CYCME	CYCLOTELLA MENEGHINIANA	P	
1MERCI	MERIDION CIRCULARE	P	
1CYMMI	CYMBELLA MINUTA	P	
2ULZON	ULOTHRIX ZONATA		P
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		128
1ACLAN	ACHNANTHES LANCEOLATA	P	
4OSSPP	OSCILLATORIA SP.		P
1CAAMP	CALONEIS AMPHISBAENA	P	
1SUANG	SURIRELLA ANGUSTATA	P	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	P	
1COCPL	COCCONEIS PLACENTULA	P	
1GYSPE	GYROSIGMA SPENCERII	P	
1SYACU	SYNEDRA ACUS	P	
1SYPUL	SYNEDRA PULCHELLA VAR. LANCEOLATA	P	
4ANASP	ANABAENA SP.		P

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STATION I  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 062780

C - 5316    V - 100 ML   DF - 1119    L - 50 MM    W - 1    MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 29-132        ANALYST - RD

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                                                                              NUMBER COUNTED
                                                                              --------------

                                                                      DIATOMS             NON-DIATOMS
TAXON CODE   TAXON                                           PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
----------------------------------------------------------------------------------------------------


  1CAAMP   CALONEIS AMPHISBAENA                                     P
  1SUOVA   SURIRELLA OVATA                                          47
  1SUOVL   SURIRELLA OVALIS                                         2
  1GYSPE   GYROSIGMA SPENCERII                                      P
  2CLUSP   CLOSTERIUM SP.                                                              1
  1FRACR   FRAGILARIA CROTONENSIS                                   10
  1RHGIV   RHOPALODIA GIBBA                                         P
  1NAVIR   NAVICULA VIRIDULA                                        200
  1NIHUN   NITZSCHIA HUNGARICA                                      9
  1NIFON   NITZSCHIA FONTICOLA                                      22
  1MERCI   MERIDION CIRCULARE                                       2
  1NIPAL   NITZSCHIA PALEA                                          27
  1ACLAN   ACHNANTHES LANCEOLATA                                    7
  1NILIN   NITZSCHIA LINEARIS                                       21
  1NIACI   NITZSCHIA ACICULARIS                                     1
  1FRAVA   FRAGILARIA VAUCHERIAE                                    3
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                           P
  2MICSP   MICROSPORA SP.                                                              2
  1NIDIS   NITZSCHIA DISSIPATA                                      2
  1GOOLI   GOMPHONEMA OLIVACEUM                                     10
  1NAMEU   NAVICULA MENISCULUS VAR. UPSALIENSIS                     9
  1NASEA   NAVICULA SECRETA VAR. APICULATA                          22
  1NAMIN   NAVICULA MINIMA                                          6
  1SUANG   SURIRELLA ANGUSTATA                                      1
  1NAHEU   NAVICULA HEUFLERI                                        5
  1SYMIN   SYNEDRA MINUSCULA                                        2
  1NASPP   NAVICULA SP.                                             1
  1NACRY   NAVICULA CRYPTOCEPHALA                                   1
  1ACMIN   ACHNANTHES MINUTISSIMA                                   3
  1NIACI   NITZSCHIA ACICULARIS                                     4
  1NITRL   NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                   3
  1COCPE   COCCONEIS PEDICULUS                                      2
  1CYMMI   CYMBELLA MINUTA                                          1
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                       1


  1NIDEN   NITZSCHIA DENTICULA                                      P
  1GOSUS   GOMPHONEMA SUBCLAVATUM VAR. UPSALIENSIS                  P
  1GOPAR   GOMPHONEMA PARVULUM                                      P
  1NACUS   NAVICULA CUSPIDATA                                       P
  1HANAM   HANTZSCHIA AMPHIOXYS                                     P
  6PHSPP   PHORMIDIUM SP.                                                              1

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STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 062780

C - 2387    V - 100 ML   DF - 119     L - 50 MM    W - 1    MM   D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 30-132        ANALYST - RD

-------------------------------------------------------------------------------------------------------

                                                                                NUMBER COUNTED
                                                                                --------------

                                                                          DIATOMS             NON-DIATOMS
TAXON CODE   TAXON                                                   PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
-------------------------------------------------------------------------------------------------------

  1RHGIV    RHOPALODIA GIBBA                                                 P
  1SUOVL    SURIRELLA OVALIS                                                 P
  1RHCUR    RHOICOSPHENIA CURVATA                                            P
  1FRACR    FRAGILARIA CROTONENSIS                                           P
  1HANAM    HANTZSCHIA AMPHIOXYS                                             P
  1CYDSO    CYMATOPLEURA SOLEA                                               P
  1ACLAD    ACHNANTHES LANCEOLATA VAR. DUBIA                                 7
  1NAHEU    NAVICULA HEUFLERI                                                13
  1NIACI    NITZSCHIA ACICULARIS                                             18
  1NAVIR    NAVICULA VIRIDULA                                                150
  1NASEA    NAVICULA SECRETA VAR. APICULATA                                  37
  1NAMIN    NAVICULA MINIMA                                                  3
  1GOOLI    GOMPHONEMA OLIVACEUM                                             40
  1NIDIS    NITZSCHIA DISSIPATA                                              15
  1NIFON    NITZSCHIA FONTICOLA                                              80
  1NACRY    NAVICULA CRYPTOCEPHALA                                           1
  4ANASP    ANABAENA SP.                                                                        1
  4PHSPP    PHORMIDIUM SP.                                                                      1
  2PALCH    PALMELLA STAGE OF CHAETOPHORACEAE                                                   5
  1NACUS    NAVICULA CUSPIDATA                                               P
  1NIHUN    NITZSCHIA HUNGARICA                                              8
  1FRAVA    FRAGILARIA VAUCHERIAE                                            6
  1ACMIN    ACHNANTHES MINUTISSIMA                                           6
  1NILIN    NITZSCHIA LINEARIS                                               13
  1SUOVA    SURIRELLA OVATA                                                  12
  1NIPAL    NITZSCHIA PALEA                                                  57
  1NAPYG    NAVICULA PYGMAEA                                                 1
  1NAARV    NAVICULA ARVENSIS                                                9
  1AMPER    AMPHORA PERPUSILLA                                               7
  1NAPEL    NAVICULA PELLICULOSA                                             7
  1NACRV    NAVICULA CRYPTOCEPHALA VAR. VENETA                               1
  1SYULN    SYNEDRA ULNA                                                     1

  1NAMUU    NAVICULA MUTICA VAR. UNDULATA                                    P
  1CYCME    CYCLOTELLA MENEGHINIANA                                          P
  1CYCIE    CYCLOTELLA STELLIGERA                                            P
  1COCPE    COCCONEIS PEDICULUS                                              P
  1CYMMI    CYMBELLA MINUTA                                                  P
  1MAGRE    MASTOGLOIA GREVILLEI                                             P
  1NITRL    NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                           P
  4OSSPP    OSCILLATORIA SP.                                                                    2
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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 062780

C - 1677    V - 100 ML   DF - 1:9     L - 50 MM    W - 1    MM   D - 1  MM    S - 2     A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 32-132        ANALYST - RD

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                                                                         NUMBER COUNTED
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                                                                  DIATOMS                NON-DIATOMS
TAXON CODE   TAXON                                         PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
---------------------------------------------------------------------------------------------------------

  1NIACI   NITZSCHIA ACICULARIS                                   65
  1SUOVL   SURIRELLA OVALIS                                       12
  1AMOVP   AMPHORA OVALIS                                         P
  1PIMAI   PINNULARIA MAIOR                                       P
  1SYACU   SYNEDRA ACUS                                           2
  1NACUS   NAVICULA CUSPIDATA                                     P
  1NISIE   NITZSCHIA SIGMOIDEA                                    P
  1NIHOL   NITZSCHIA HOLSATICA                                    130
  1NAMIN   NAVICULA MINIMA                                        3
  1NATSC   NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES               4
  1NIHUN   NITZSCHIA HUNGARICA                                    8
  1NILIN   NITZSCHIA LINEARIS                                     17
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                     25
  1SUOVA   SURIRELLA OVATA                                        13
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                             28
  2MOUSP   MOUGEOTIA SP.                                                                 P
  2ULZON   ULOTHRIX ZONATA                                                               16
  1NIFON   NITZSCHIA FONTICOLA                                    12
  1FRACR   FRAGILARIA CROTONENSIS                                 5
  1NAMIN   NAVICULA MINIMA                                        3
  1ACMIN   ACHNANTHES MINUTISSIMA                                 6
  1NASEA   NAVICULA SECRETA VAR. APICULATA                        34
  1NIPAL   NITZSCHIA PALEA                                        35
  1GOOLI   GOMPHONEMA OLIVACEUM                                   14
  1ACLAN   ACHNANTHES LANCEOLATA                                  3
  1GOPAR   GOMPHONEMA PARVULUM                                    6
  1GOANG   GOMPHONEMA ANGUSTATUM                                  3


  1AMPER   AMPHORA PERPUSILLA                                     4
  1NAPYG   NAVICULA PYGMAEA                                       1
  1NAVIR   NAVICULA VIRIDULA                                      9
  1NIDIS   NITZSCHIA DISSIPATA                                    3
  1CYCME   CYCLOTELLA MENEGHINIANA                                4
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                         1
  1FRAVA   FRAGILARIA VAUCHERIAE                                  5
  1SYFAS   SYNEDRA FASCICULATA                                    1
  1CYMMI   CYMBELLA MINUTA                                        1
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                       4
  1NITRL   NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                 2
  1NAHEU   NAVICULA HEUFLERI                                      5
  1FRALE   FRAGILARIA LEPTOSTAURON                                2
  1SUANG   SURIRELLA ANGUSTATA                                    P
  1CYMTU   CYMBELLA TUMIDA                                        P
  1GOTRU   GOMPHONEMA TRUNCATUM                                   P
  1NAMUU   NAVICULA MUTICA VAR. UNDULATA                          P
  1PIBOR   PINNULARIA BOREALIS                                    P
  4PHSPP   PHORMIDIUM SP.                                                                5
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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 062780

C - 2074    V - 100 ML   DF - 1.9     L - 50 MM    W - 1    MM    D - 1  MM    S - 2     A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 31-132        ANALYST - RO

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                                                                                NUMBER COUNTED
                                                                                --------------

                                                                          DIATOMS               NON-DIATOMS
TAXON CODE   TAXON                                                 PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
---------------------------------------------------------------------------------------------------------

  1NIACI    NITZSCHIA ACICULARIS                                          78
  1GOTRU    GOMPHONEMA TRUNCATUM                                          P
  1SUOVL    SURIRELLA OVALIS                                              P
  1GYSPE    GYROSIGMA SPENCERII                                           P
  1CAAMP    CALONEIS AMPHISBAENA                                          P
  1CYCME    CYCLOTELLA MENEGHINIANA                                       16
  1NASEA    NAVICULA SECRETA VAR. APICULATA                               51
  1NIDIS    NITZSCHIA DISSIPATA                                           16
  1NIPAL    NITZSCHIA PALEA                                               44
  1NILIN    NITZSCHIA LINEARIS                                            10
  1NIFON    NITZSCHIA FONTICOLA                                           17
  1ACMIN    ACHNANTHES MINUTISSIMA                                        17
  1NIHOL    NITZSCHIA HOLSATICA                                           171
  1NAHAL    NAVICULA HALOPHILA                                            2
  1SUOVA    SURIRELLA OVATA                                               13
  2PALCH    PALMELLA STAGE OF CHAETOPHORACEAE                                                  98
  2ULZON    ULOTHRIX ZONATA                                                                    29
  4OSSPP    OSCILLATORIA SP.                                                                   1
  1SUANG    SURIRELLA ANGUSTATA                                           2
  1NAHEU    NAVICULA HEUFLERI                                             2
  1SYULN    SYNEDRA ULNA                                                  1
  1NIFRU    NITZSCHIA FRUSTULUM                                           8
  1NAVIR    NAVICULA VIRIDULA                                             17
  1FRAVA    FRAGILARIA VAUCHERIAE                                         14
  1SYMIN    SYNEDRA MINUSCULA                                             6
  1NACRV    NAVICULA CRYPTOCEPHALA VAR. VENETA                            8
  1GOPAR    GOMPHONEMA PARVULUM                                           2
  1NIHUN    NITZSCHIA HUNGARICA                                           4
  1SYFAS    SYNEDRA FASCICULATA                                           2
  1NISIG    NITZSCHIA SIGMOIDEA                                           1


  1NAMIN    NAVICULA MINIMA                                               5
  1NITRL    NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                        1
  1NACRY    NAVICULA CRYPTOCEPHALA                                        3
  1GOANG    GOMPHONEMA ANGUSTATUM                                         6
  1NAPEL    NAVICULA PELLICULOSA                                          1
  1ACLAD    ACHNANTHES LANCEOLATA VAR. DUBIA                              5
  1NATSC    NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES                      4
  1CAVEN    CALONEIS VENTRICOSA                                           2
  1NIAPI    NITZSCHIA APICULATA                                           1
  4PHSPP    PHORMIDIUM SP.                                                                     39
  4ANASP    ANABAENA SP.                                                                       2
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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 062780

C - 1216    V - 100 ML    DF - 1:9     L - 50 MM    W - 1    MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 33-132        ANALYST - RD
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                                                                           NUMBER COUNTED
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                                                                       DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                              PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1NISIE   NITZSCHIA SIGMOIDEA                                         30
  1CAAMP   CALONEIS AMPHISBAENA                                        P
  1GYSPE   GYROSIGMA SPENCERII                                         P
  1SUOVA   SURIRELLA OVATA                                             36
  1SUOVL   SURIRELLA OVALIS                                            P
  1SYACU   SYNEDRA ACUS                                                1
  1HANAM   HANTZSCHIA AMPHIOXYS                                        P
  1COCPE   COCCONEIS PEDICULUS                                         P
  1CYOSO   CYMATOPLEURA SOLEA                                          P
  1NASEA   NAVICULA SECRETA VAR. APICULATA                             34
  1NIPAL   NITZSCHIA PALEA                                             100
  1NATSC   NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES                    10
  1CYCME   CYCLOTELLA MENEGHINIANA                                     4
  1NAHEU   NAVICULA HEUFLERI                                           1
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                          33
  4OSSPP   OSCILLATORIA SP.                                                                 P
  2ULZON   ULOTHRIX ZONATA                                                                  1
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                168
  4ANASP   ANABAENA SP.                                                                     P


  2CHAPR   BULBOCHAETA SP.                                                                  P
  1NIFON   NITZSCHIA FONTICOLA                                         27
  1NIACI   NITZSCHIA ACICULARIS                                        12
  1NIHOL   NITZSCHIA HOLSATICA                                         88
  1NAPEL   NAVICULA PELLICULOSA                                        1
  1FRAVA   FRAGILARIA VAUCHERIAE                                       10
  1NILIN   NITZSCHIA LINEARIS                                          29
  1NIHUN   NITZSCHIA HUNGARICA                                         10
  1CASMI   CALONEIS SMITHII                                            1
  1NAVIR   NAVICULA VIRIDULA                                           9
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                            10
  1GOANG   GOMPHONEMA ANGUSTATUM                                       7
  1ACMIN   ACHNANTHES MINUTISSIMA                                      3
  1GOOLI   GOMPHONEMA OLIVACEUM                                        6
  1NACIN   NAVICULA CINCTA                                             1
  1SUANG   SURIRELLA ANGUSTATA                                         1
  1SYULN   SYNEDRA ULNA                                                2
  1NIDIS   NITZSCHIA DISSIPATA                                         10
  1NACRY   NAVICULA CRYPTOCEPHALA                                      1
  1STASM   STAURONEIS SMITHII                                          2
  1NASAI   NAVICULA SALINARUM VAR. INTERMEDIA                          1
  1NAMUL   NAVICULA MUTICA VAR. UNDULATA                               1
  1SYFAS   SYNEDRA FASCICULATA                                         1

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 062780

C - 1386    V - 100 ML   DF - 1:9     L - 50 MM    W - 1     MM    D - 1  MM    S - 2     A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 34-132        ANALYST - RD

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                                                                                  NUMBER COUNTED
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                                                                            DIATOMS             NON-DIATOMS
TAXON CODE   TAXON                                                    PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1SUOVL   SURIRELLA OVALIS                                                  P
  1NIACI   NITZSCHIA ACICULARIS                                              11
  1NAVIR   NAVICULA VIRIDULA                                                 395
  1NIPAL   NITZSCHIA PALEA                                                   73
  1NASEA   NAVICULA SECRETA VAR. APICULATA                                   39
  1GOOLI   GOMPHONEMA OLIVACEUM                                              5
  1SYMIN   SYNEDRA MINUSCULA                                                 1
  1NIHOL   NITZSCHIA HOLSATICA                                               58
  1SUOVA   SURIRELLA OVATA                                                   10
  1NILIN   NITZSCHIA LINEARIS                                                2
  1SUANG   SURIRELLA ANGUSTATA                                               1
  1NIDIS   NITZSCHIA DISSIPATA                                               4
  1NAMIN   NAVICULA MINIMA                                                   1
  1NASAI   NAVICULA SALINARUM VAR. INTERMEDIA                                1
  1COCPE   COCCONEIS PEDICULUS                                               1

  1ACMIN   ACHNANTHES MINUTISSIMA                                            3
  1NACIN   NAVICULA CINCTA                                                   1
  1NIFON   NITZSCHIA FONTICOLA                                               6
  1NIHUN   NITZSCHIA HUNGARICA                                               1
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                                1
  4ANASP   ANABAENA SP.                                                                          1
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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 062780

C - 1541    V - 100 ML   DF - 1:9     L - 50 MM   W - 1    MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 36-132        ANALYST - RD

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                                                                         NUMBER COUNTED
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                                                                    DIATOMS            NON-DIATOMS
TAXON CODE   TAXON                                            PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1NAVIR   NAVICULA VIRIDULA                                          380
  1SUOVL   SURIRELLA OVALIS                                           1
  1SUOVA   SURIRELLA OVATA                                            14
  1SUANG   SURIRELLA ANGUSTATA                                        8
  1NIPAL   NITZSCHIA PALEA                                            38
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                           1
  1SYMIN   SYNEDRA MINUSCULA                                          4
  1NAMIN   NAVICULA MINIMA                                            1
  1NIHOL   NITZSCHIA HOLSATICA                                        67
  1NASEA   NAVICULA SECRETA VAR. APICULATA                            16
  1NIACI   NITZSCHIA ACICULARIS                                       7
  1NAARV   NAVICULA ARVENSIS                                          2
  1NACIN   NAVICULA CINCTA                                            1
  1NIFON   NITZSCHIA FONTICOLA                                        1
  1NILIN   NITZSCHIA LINEARIS                                         4
  1GOOLI   GOMPHONEMA OLIVACEUM                                       1
  1NIHUN   NITZSCHIA HUNGARICA                                        1
  1CYCME   CYCLOTELLA MENEGHINIANA                                    1

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 062780

C - 1277    V - 100 ML   DF - 119     L - 50 MM    W - 1    MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD


LOG NUMBER - 35-132        ANALYST - RD
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                                                                          NUMBER COUNTED
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                                                                      DIATOMS             NON-DIATOMS
TAXON CODE   TAXON                                               PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1NIACI   NITZSCHIA ACICULARIS                                         1
  1NAVIR   NAVICULA VIRIDULA                                            117
  1SUOVL   SURIRELLA OVALIS                                             P
  1SUOVA   SURIRELLA OVATA                                              35
  1SYACU   SYNEDRA ACUS                                                 P
  1NIPAL   NITZSCHIA PALEA                                              46
  1SYMIN   SYNEDRA MINUSCULA                                            10
  1NAMIN   NAVICULA MINIMA                                              3
  1NIHOL   NITZSCHIA HOLSATICA                                          53
  1GOANG   GOMPHONEMA ANGUSTATUM                                        1
  1NAHEU   NAVICULA HEUFLERI                                            1
  1ACMIN   ACHNANTHES MINUTISSIMA                                       7
  1NATSC   NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES                     1
  1NASEA   NAVICULA SECRETA VAR. APICULATA                              17
  1NIFON   NITZSCHIA FONTICOLA                                          3
  1AMPER   AMPHORA PERPUSILLA                                           1
  4ANASP   ANABAENA SP.                                                                        P
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                   P
  4OSSPP   OSCILLATORIA SP.                                                                    P
  1SUANG   SURIRELLA ANGUSTATA                                          3
  1FRAVA   FRAGILARIA VAUCHERIAE                                        4
  1NILIN   NITZSCHIA LINEARIS                                           6
  1CYCME   CYCLOTELLA MENEGHINIANA                                      3
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                           1
  1NACRY   NAVICULA CRYPTOCEPHALA                                       1
  1NASAI   NAVICULA SALINARUM VAR. INTERMEDIA                           2

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AUGUST (old)

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PERIPHYTON BENCH SHEET
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CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 080186

C - 965     V - 100 ML   DF - 1149    L - 50 MM   W - 1    MM   D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 67-132        ANALYST - RD

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                                                                            NUMBER COUNTED
                                                                            --------------

                                                                    DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                           PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
------------------------------------------------------------------------------------------------------

 2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                P
 2CLOSP   CLOSTERIUM SP.                                                                   P
 1NISIE   NITZSCHIA SIGMOIDEA                                      26
 1COCPE   COCCONEIS PEDICULUS                                      P
 1RHCUR   RHOICOSPHENIA CURVATA                                    1
 1GYSPE   GYROSIGMA SPENCERII                                      1
 1ACLAN   ACHNANTHES LANCEOLATA                                    5
 1NAVIR   NAVICULA VIRIDULA                                        102
 1NASEA   NAVICULA SECRETA VAR. APICULATA                          72
 1GOANG   GOMPHONEMA ANGUSTATUM                                    2
 1NILIN   NITZSCHIA LINEARIS                                       10
 1NIDIS   NITZSCHIA DISSIPATA                                      17
 1ACMIN   ACHNANTHES MINUTISSIMA                                   23
 1NIHOL   NITZSCHIA HOLSATICA                                      21
 1GOOLI   GOMPHONEMA OLIVACEUM                                     6
 1NIPAL   NITZSCHIA PALEA                                          31
 1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                       4
 1NIFRU   NITZSCHIA FRUSTULUM                                      18
 1SUOVA   SURIRELLA OVATA                                          2
 1SYULN   SYNEDRA ULNA                                             2
 1NAPEL   NAVICULA PELLICULOSA                                     3
 1DIVUL   DIATOMA VULGARE                                          1
 1NANOT   NAVICULA NOTHA                                           2
 1ACMIC   ACHNANTHES MICROCEPHALA                                  1
 1NARHY   NAVICULA RHYNCHOCEPHALA                                  2
 1NAHEU   NAVICULA HEUFLERI                                        6
 1NAMEU   NAVICULA MENISCULUS VAR. UPSALIENSIS                     4
 1GOINT   GOMPHONEMA INTRICATUM                                    1
 1CYCME   CYCLOTELLA MENEGHINIANA                                  5
 1NIACI   NITZSCHIA ACICULARIS                                     1
 1RHMUS   RHOPALODIA MUSCULUS                                      2
 1FRAVA   FRAGILARIA VAUCHERIAE                                    2
 1AMVEN   AMPHORA VENETA                                           2
 1SYMIN   SYNEDRA MINUSCULA                                        1
 1HANAM   HANTZSCHIA AMPHIOXYS                                     1
 1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                           1
 2DRAPA   DRAPARNALDIA SP.                                                                 1
 4OSSPP   OSCILLATORIA SP.                                                                 3

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STATION 1 - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 080180

C - 982 V - 100 ML DF - 1:49 L - 50 MM W - 1 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 80-132 ANALYST - RD

		NUMBER COUNTED	
TAXON CODE	TAXON	DIATOMS PROPORTIONAL COUNT	NON-DIATOMS SEDGWICK-RAFTER COUNT
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		P
2STITE	STIGEOCLONIUM TENUE		P
2CLOSP	CLOSTERIUM SP.		P
1NISIG	NITZSCHIA SIGMOIDEA	17	
1CAAMP	CALONEIS AMPHISBAENA	P	
1SUOVL	SURIRELLA OVALIS	P	
1GYSPE	GYROSIGMA SPENCERII	P	
2CLAGL	CLADOPHORA GLOMERATA		P
1NACUS	NAVICULA CUSPIDATA	P	
1PIBRE	PINNULARIA BREBISSONII	P	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	4	
1DIVUL	DIATOMA VULGARE	4	
1NAVIR	NAVICULA VIRIDULA	101	
1NIHOL	NITZSCHIA HOLSATICA	30	
1FRAVA	FRAGILARIA VAUCHERIAE	17	
1ACMIN	ACHNANTHES MINUTISSIMA	3	
1CYMMI	CYMBELLA MINUTA	1	
1NASEA	NAVICULA SECRETA VAR. APICULATA	34	
1NIPAL	NITZSCHIA PALEA	11	
1NIDIS	NITZSCHIA DISSIPATA	54	
1NAHEU	NAVICULA HEUFLERI	7	
1COCPL	COCCONEIS PLACENTULA	1	
1NAMEU	NAVICULA MENISCULUS VAR. UPSALIENSIS	5	
1FRACA	FRAGILARIA CAPUCINA	1	
1NIFRU	NITZSCHIA FRUSTULUM	20	
1GOOLI	GOMPHONEMA OLIVACEUM	8	
1NIHUN	NITZSCHIA HUNGARICA	5	
1NICOM	NITZSCHIA COMMUNIS	1	
1GOINT	GOMPHONEMA INTRICATUM	1	
1ACLAN	ACHNANTHES LANCEOLATA	9	
1RHCUR	RHOICOSPHENIA CURVATA	1	
1NAPEL	NAVICULA PELLICULOSA	6	
1DIHIM	DIATOMA HIEMALE VAR. MESODON	1	
1SUOVA	SURIRELLA OVATA	3	
1NAAUR	NAVICULA AURICULATA	2	
1HANAM	HANTZSCHIA AMPHIOXYS	2	
1DITEE	DIATOMA TENUE VAR. ELONGATUM	1	
1SYULN	SYNEDRA ULNA	2	
1SYFAS	SYNEDRA FASCICULATA	1	
1CYCME	CYCLOTELLA MENEGHINIANA	1	
1RHMUS	RHOPALODIA MUSCULUS	1	
4ANASP	ANABAENA SP.		1

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STATION I  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 080180

C - 790     V - 100 ML    DF - 1:49    L - 50 MM    W - 1    MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 69-132        ANALYST - RD

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                                                                         NUMBER COUNTED
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                                                                    DIATOMS                NON-DIATOMS
TAXON CODE   TAXON                                            PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
-------------------------------------------------------------------------------------------------------


  2STITE    STIGEOCLONIUM TENUE                                                            P
  1GYSPE    GYROSIGMA SPENCERII                                       1
  1NISIG    NITZSCHIA SIGMOIDEA                                       26
  4ANASP    ANABAENA SP.                                                                   P
  2CLOSP    CLOSTERIUM SP.                                                                 P
  1CAAMP    CALONEIS AMPHISBAENA                                      P
  1COCPL    COCCONEIS PLACENTULA                                      3
  1NIDIS    NITZSCHIA DISSIPATA                                       60
  1NASEA    NAVICULA SECRETA VAR. APICULATA                           60
  1NIFRU    NITZSCHIA FRUSTULUM                                       57
  1ACMIN    ACHNANTHES MINUTISSIMA                                    68
  1NIPAL    NITZSCHIA PALEA                                           35
  1NAVIR    NAVICULA VIRIDULA                                         100
  1ACLAD    ACHNANTHES LANCEOLATA VAR. DUBIA                          8
  1NIHOL    NITZSCHIA HOLSATICA                                       32
  1STAST    STEPHANODISCUS ASTREA                                     2
  1RHCUR    RHOICOSPHENIA CURVATA                                     1
  1AMVEN    AMPHORA VENETA                                            1
  1ACAFF    ACHNANTHES AFFINIS                                        6
  1GOOLI    GOMPHONEMA OLIVACEUM                                      12
  1NARHY    NAVICULA RHYNCHOCEPHALA                                   1
  1ACLAN    ACHNANTHES LANCEOLATA                                     9
  1SYULN    SYNEDRA ULNA                                              5
  1NAHEU    NAVICULA HEUFLERI                                         2
  1AMOVP    AMPHORA OVALIS                                            2
  1GOANG    GOMPHONEMA ANGUSTATUM                                     2
  1SUOVA    SURIRELLA OVATA                                           2
  1NIAPI    NITZSCHIA APICULATA                                       4
  1NAMEU    NAVICULA MENISCULUS VAR. UPSALIENSIS                      5
  1NACRY    NAVICULA CRYPTOCEPHALA                                    3
  1NITRL    NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                    1
  1CYMSI    CYMBELLA SINUATA                                          3
  1AMPER    AMPHORA PERPUSILLA                                        1
  1SYMIN    SYNEDRA MINUSCULA                                         2


  1CYCME    CYCLOTELLA MENEGHINIANA                                   1
  1GOACU    GOMPHONEMA ACUMINATUM                                     1
  1NIACI    NITZSCHIA ACICULARIS                                      7
  1NACRV    NAVICULA CRYPTOCEPHALA VAR. VENETA                        1
  1RHMUS    RHOPALODIA MUSCULUS                                       1
  1RHGIV    RHOPALODIA GIBBA                                          1
  1SUOVL    SURIRELLA OVALIS                                          P

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STATION 2 - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 080180

C - 841 V - 100 ML DF - 1:49 L - 50 MM W - 1 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 73-132 ANALYST - RD

		NUMBER COUNTED	
TAXON CODE	TAXON	DIATOMS PROPORTIONAL COUNT	NON-DIATOMS SEDGWICK-RAFTER COUNT
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		10
2DRAPA	DRAPARNALDIA SP.		17
2OESPP	OEDOGONIUM SP.		P
1CAAMP	CALONEIS AMPHISBAENA	P	
1GYSPE	GYROSIGMA SPENCERII	1	
2CLOSP	CLOSTERIUM SP.		P
1DITEE	DIATOMA TENUE VAR. ELONGATUM	P	
1NISIE	NITZSCHIA SIGMOIDEA	12	
1NILIN	NITZSCHIA LINEARIS	5	
1NAVIR	NAVICULA VIRIDULA	82	
1NASEA	NAVICULA SECRETA VAR. APICULATA	100	
1NIPAL	NITZSCHIA PALEA	52	
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	1	
1GOOLI	GOMPHONEMA OLIVACEUM	3	
1CYCME	CYCLOTELLA MENEGHINIANA	3	
1GOANG	GOMPHONEMA ANGUSTATUM	4	
1COCPL	COCCONEIS PLACENTULA	3	
3NITRL	NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS	1	
1NIDIS	NITZSCHIA DISSIPATA	22	
1NIHOL	NITZSCHIA HOLSATICA	14	
1ACLAN	ACHNANTHES LANCEOLATA	1	
1FRAVA	FRAGILARIA VAUCHERIAE	1	
1NIFRU	NITZSCHIA FRUSTULUM	18	
1CYMSI	CYMBELLA SINUATA	2	
1ACMIN	ACHNANTHES MINUTISSIMA	2	
1NAHEU	NAVICULA HEUFLERI	7	
1NACRY	NAVICULA CRYPTOCEPHALA	7	
1SUOVA	SURIRELLA OVATA	1	
1MERCI	MERIDION CIRCULARE	1	
1NAMEU	NAVICULA MENISCULUS VAR. UPSALIENSIS	2	
1NACRV	NAVICULA CRYPTOCEPHALA VAR. VENETA	2	
1NAARV	NAVICULA ARVENSIS	1	
1NARHY	NAVICULA RHYNCHOCEPHALA	4	
1PIBOR	PINNULARIA BOREALIS	1	
1SYULN	SYNEDRA ULNA	1	
1NAPEL	NAVICULA PELLICULOSA	1	
1SYPUL	SYNEDRA PULCHELLA VAR. LANCEOLATA	1	
1ACMIC	ACHNANTHES MICROCEPHALA	1	
1NIACI	NITZSCHIA ACICULARIS	2	
1NACIN	NAVICULA CINCTA	1	
1GOSIM	GOMPHONEMA SIMUS	1	
1CAVEN	CALONEIS VENTRICOSA	1	
1AMPER	AMPHORA PERPUSILLA	1	
1CYMMI	CYMBELLA MINUTA	1	
2MICSP	MICROSPORA SP.		2
2SCEQU	SCENEDESMUS QUADRICAUDA		1
4ANASP	ANABAENA SP.		1

STATION 2 - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 080180

C - 734 V - 100 ML DF - 1:45 L - 50 MM W - 1 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 74-132 ANALYST - RD

TAXON CODE	TAXON	NUMBER COUNTED DIATOMS PROPORTIONAL COUNT	 NON-DIATOMS SEDGWICK-RAFTER COUNT
2ULSPP	ULOTHRIX		P
2DRAPA	DRAPARNALDIA SP.		17
2OESPP	OEDOGONIUM SP.		P
2MOUSP	MOUGEOTIA SP.		P
1DIVUL	DIATOMA VULGARE	P	
2CLOSP	CLOSTERIUM SP.		P
1GYSPE	GYROSIGMA SPENCERII	P	
1NISIE	NITZSCHIA SIGMOIDEA	59	
1NIDIS	NITZSCHIA DISSIPATA	14	
1NASEA	NAVICULA SECRETA VAR. APICULATA	61	
1NAVIR	NAVICULA VIRIDULA	100	
1NIPAL	NITZSCHIA PALEA	39	
1CYCME	CYCLOTELLA MENEGHINIANA	5	
1NIHOL	NITZSCHIA HOLSATICA	8	
1NAMIN	NAVICULA MINIMA	2	
1ACAFF	ACHNANTHES AFFINIS	2	
1ACLAN	ACHNANTHES LANCEOLATA	1	
1NAPEL	NAVICULA PELLICULOSA	1	
1NACUS	NAVICULA CUSPIDATA	1	
1GOOLI	GOMPHONEMA OLIVACEUM	4	
1PLDEL	PLEUROSIGMA DELICATISSIMA	1	
1ACMIN	ACHNANTHES MINUTISSIMA	5	
1NIHUN	NITZSCHIA HUNGARICA	4	
1SYMIN	SYNEDRA MINUSCULA	1	
1CAAMP	CALONEIS AMPHISBAENA	1	
1SYULN	SYNEDRA ULNA	6	
1NARHY	NAVICULA RHYNCHOCEPHALA	3	
1GOANG	GOMPHONEMA ANGUSTATUM	8	
1NACRV	NAVICULA CRYPTOCEPHALA VAR. VENETA	2	
1SYULO	SYNEDRA ULNA VAR. OXYRHYNCHUS	6	
1NIFRU	NITZSCHIA FRUSTULUM	14	
1SUOVA	SURIRELLA OVATA	2	
1CYMMI	CYMBELLA MINUTA	1	
1STAST	STEPHANODISCUS ASTREA	1	
1NAHEU	NAVICULA HEUFLERI	2	
1NACRY	NAVICULA CRYPTOCEPHALA	1	
1SYFAS	SYNEDRA FASCICULATA	2	
1HANAM	HANTZSCHIA AMPHIOXYS	3	
1DEELE	DENTICULA ELEGANS	1	
1ACLIN	ACHNANTHES LINEARIS	1	
1FRAVA	FRAGILARIA VAUCHERIAE	1	
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	1	
1FRACV	FRAGILARIA CONSTRUENS VAR. VENETA	1	
1GOSUB	GOMPHONEMA SUBCLAVATUM	2	
1SUOVL	SURIRELLA OVALIS	P	
1COCPE	COCCONEIS PEDICULUS	P	
1SUANG	SURIRELLA ANGUSTATA	P	
1AMPER	AMPHORA PERPUSILLA	P	
4ANASP	ANABAENA SP.		1

STATION 2 - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 080180

C - 1128 V - 100 ML DF - 1149 L - 50 MM W - 1 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 75-132 ANALYST - RD

		NUMBER COUNTED	
TAXON CODE	TAXON	DIATOMS PROPORTIONAL COUNT	NON-DIATOMS SEDGWICK-RAFTER COUNT
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		P
2DRAPA	DRAPARNALDIA SP.		22
2MOUSP	MOUGEOTIA SP.		P
1PISPP	PINNULARIA SP.	P	
2CLOSP	CLOSTERIUM SP.		P
1NISIE	NITZSCHIA SIGMOIDEA	33	
5PHASE	PHACUS SP.		P
1GYSPE	GYROSIGMA SPENCERII	1	
1COCPE	COCCONEIS PEDICULUS	P	
1NAVIR	NAVICULA VIRIDULA	102	
1SUOVA	SURIRELLA OVATA	4	
1STAST	STEPHANODISCUS ASTREA	2	
1NASEA	NAVICULA SECRETA VAR. APICULATA	46	
1NIDIS	NITZSCHIA DISSIPATA	5	
1NIFRU	NITZSCHIA FRUSTULUM	13	
1NIHUN	NITZSCHIA HUNGARICA	1	
1HANAM	HANTZSCHIA AMPHIOXYS	P	
1SUOVL	SURIRELLA OVALIS	2	
1SYULN	SYNEDRA ULNA	5	
1NACRY	NAVICULA CRYPTOCEPHALA	2	
1NARHY	NAVICULA RHYNCHOCEPHALA	4	
1NIHOL	NITZSCHIA HOLSATICA	10	
1FRAVA	FRAGILARIA VAUCHERIAE	5	
1ACMIN	ACHNANTHES MINUTISSIMA	5	
1NIPAL	NITZSCHIA PALEA	26	
1NAHEU	NAVICULA HEUFLERI	5	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	2	
1GOOLI	GOMPHONEMA OLIVACEUM	1	
1GOSIM	GOMPHONEMA SIMUS	1	
1SYULD	SYNEDRA ULNA VAR. OXYRHYNCHUS	1	
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	1	
1GOANG	GOMPHONEMA ANGUSTATUM	2	
1SYMIN	SYNEDRA MINUSCULA	2	
1ACAFF	ACHNANTHES AFFINIS	2	
1CAVEN	CALONEIS VENTRICOSA	1	
1ACLAN	ACHNANTHES LANCEOLATA	2	
1GOSUB	GOMPHONEMA SUBCLAVATUM	1	
1DIVUL	DIATOMA VULGARE	1	
1CYCME	CYCLOTELLA MENEGHINIANA	P	
2OESPP	OEDOGONIUM SP.		2

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 080180

C - 738      V - 100 ML   DF - 1:9     L - 50 MM   W - 1    MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 79-132        ANALYST - RD

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                                                                         NUMBER COUNTED
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                                                                      DIATOMS            NON-DIATOMS
TAXON CODE   TAXON                                               PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  2CLAGL   CLADOPHORA GLOMERATA                                                              P
  1GYSPE   GYROSIGMA SPENCERII                                         P
  1CAAMP   CALONEIS AMPHISBAENA                                        P
  1NAVIR   NAVICULA VIRIDULA                                           162
  1ACMIN   ACHNANTHES MINUTISSIMA                                      32
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                            6
  1NISIE   NITZSCHIA SIGMOIDEA                                         5
  1NIPAL   NITZSCHIA PALEA                                             5
  1NASEA   NAVICULA SECRETA VAR. APICULATA                             22

  1NIDIS   NITZSCHIA DISSIPATA                                         7
  1GOOLI   GOMPHONEMA OLIVACEUM                                        3
  1SUOVA   SURIRELLA OVATA                                             1
  1NAHEU   NAVICULA HEUFLERI                                           2
  1GOPAR   GOMPHONEMA PARVULUM                                         1
  1COCPE   COCCONEIS PEDICULUS                                         1
  1AMPER   AMPHORA PERPUSILLA                                          1
  1NIFRU   NITZSCHIA FRUSTULUM                                         5
  1NACRY   NAVICULA CRYPTOCEPHALA                                      5
  1NATSC   NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES                    1
  1ACLAN   ACHNANTHES LANCEOLATA                                       1
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                          1
  1FRAVA   FRAGILARIA VAUCHERIAE                                       P
  1ACAFF   ACHNANTHES AFFINIS                                          2
  1GOANG   GOMPHONEMA ANGUSTATUM                                       P
  1CYMMI   CYMBELLA MINUTA                                             P
  1NAARV   NAVICULA ARVENSIS                                           1
  1NIACI   NITZSCHIA ACICULARIS                                        1
  2DRAPA   DRAPARNALDIA SP.                                                                  2

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 080180

C - 545      V - 100 ML    DF - 1:9      L - 50 MM    W - 1.78 MM    D - 1  MM    S - 4     A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 80-132        ANALYST - RD

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                                                                            NUMBER COUNTED
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                                                                         DIATOMS             NON-DIATOMS
TAXON CODE   TAXON                                               PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                  P
  2CLAGL   CLADOPHORA GLOMERATA                                                               P
  2DRAPA   DRAPARNALDIA SP.                                                                   5
  1NAVIR   NAVICULA VIRIDULA                                            124
  1SUOVL   SURIRELLA OVALIS                                             P
  1GYSPE   GYROSIGMA SPENCERII                                          P
  1ACLAN   ACHNANTHES LANCEOLATA                                        7
  1NIFRU   NITZSCHIA FRUSTULUM                                          15
  1ACMIN   ACHNANTHES MINUTISSIMA                                       25
  1NIDIS   NITZSCHIA DISSIPATA                                          14
  1NASEA   NAVICULA SECRETA VAR. APICULATA                              30
  1NACRY   NAVICULA CRYPTOCEPHALA                                       3
  1NISIE   NITZSCHIA SIGMOIDEA                                          9
  1NIPAL   NITZSCHIA PALEA                                              9
  1PIBOR   PINNULARIA BOREALIS                                          2
  1COCPL   COCCONEIS PLACENTULA                                         1
  1AMPER   AMPHORA PERPUSILLA                                           5
  1NIHUN   NITZSCHIA HUNGARICA                                          1
  1GOOLI   GOMPHONEMA OLIVACEUM                                         3

  1CYMSI   CYMBELLA SINUATA                                             1
  1CYCME   CYCLOTELLA MENEGHINIANA                                      1
  1RHGIB   RHOPALODIA GIBBERULA                                         1
  1DEELE   DENTICULA ELEGANS                                            P
  1RHMUS   RHOPALODIA MUSCULUS                                          P
  1GOANG   GOMPHONEMA ANGUSTATUM                                        2
  1COCPE   COCCONEIS PEDICULUS                                          1
  1HANAM   HANTZSCHIA AMPHIOXYS                                         2
  1ACAFF   ACHNANTHES AFFINIS                                           2
  4OSSPP   OSCILLATORIA SP.                                                                   1

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 080180

C - 532      V - 100 ML    DF - 1:9     L - 50 MM   W - 1.78 MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-OLD

LOG NUMBER - 81-132        ANALYST - RD

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                                                                         NUMBER COUNTED
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                                                                    DIATOMS            NON-DIATOMS
TAXON CODE   TAXON                                             PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                P
  2CLAGL   CLADOPHORA GLOMERATA                                                             P
  1NAVIR   NAVICULA VIRIDULA                                          101
  1CYMMS   CYMBELLA MINUTA VAR. SILFSIACA                             1
  1NISIE   NITZSCHIA SIGMOIDEA                                        P
  1SUOVL   SURIRELLA OVALIS                                           P
  1COCPE   COCCONEIS PEDICULUS                                        2
  1NIDIS   NITZSCHIA DISSIPATA                                        25
  1CAAMP   CALONEIS AMPHISBAENA                                       P
  1DIVUL   DIATOMA VULGARE                                            P
  1NASEA   NAVICULA SECRETA VAR. APICULATA                            51
  1ACMIN   ACHNANTHES MINUTISSIMA                                     83
  1NIFRU   NITZSCHIA FRUSTULUM                                        25
  1ACLAN   ACHNANTHES LANCEOLATA                                      9
  1NIPAL   NITZSCHIA PALEA                                            14
  1NACRY   NAVICULA CRYPTOCFPHALA                                     5
  1ACAFF   ACHNANTHES AFFINIS                                         4
  1SYMIN   SYNFDRA MINUSCULA                                          1
  1NAHEU   NAVICULA HEUFLERI                                          1
  1NIHUN   NITZSCHIA HUNGARICA                                        2
  1GOANG   GOMPHONEMA ANGUSTATUM                                      1
  1GOOLI   GOMPHONEMA OLIVACEUM                                       2
  1NANOT   NAVICULA NOTHA                                             2
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                           1
  1AMPER   AMPHORA PERPUSILLA                                         2
  2DRAPA   DRAPARNALDIA SP.                                                                 3
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AUGUST (new)

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PERIPHYTON BENCH SHEET
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CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 080180

C - 3837    V - 100 ML   DF - 1119    L - 50 MM    W - 1    MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 64-132        ANALYST - RC

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                                                                        NUMBER COUNTED
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                                                                     DIATOMS             NON-DIATOMS
TAXON CODE   TAXON                                             PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1SUOVA   SURIRELLA OVATA                                            4
  1SYULN   SYNEDRA ULNA                                               P
  1NACUS   NAVICULA CUSPIDATA                                         P
  1GYSPE   GYROSIGMA SPENCERII                                        1
  1PIBOR   PINNULARIA BOREALIS                                        P
  2CLOSP   CLOSTERIUM SP.                                                                 P
  1NISIE   NITZSCHIA SIGMOIDEA                                        5
  1RHCUR   RHOICOSPHENIA CURVATA                                      P
  1DIVUL   DIATOMA VULGARE                                            4
  1CAAMP   CALONEIS AMPHISBAENA                                       1
  1NAVIR   NAVICULA VIRIDULA                                          100
  1NIDIS   NITZSCHIA DISSIPATA                                        82
  1ACAFF   ACHNANTHES AFFINIS                                         11
  1NARHY   NAVICULA RHYNCHOCEPHALA                                    3
  1ACMIN   ACHNANTHES MINUTISSIMA                                     20
  1NIPAL   NITZSCHIA PALEA                                            17
  1NIFRU   NITZSCHIA FRUSTULUM                                        21
  1HANAM   HANTZSCHIA AMPHIOXYS                                       1
  1NITRL   NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                     1
  1CYCME   CYCLOTELLA MENEGHINIANA                                    2
  1GOOLI   GOMPHONEMA OLIVACEUM                                       4
  1NILIN   NITZSCHIA LINEARIS                                         2
  1AMPER   AMPHORA PERPUSILLA                                         2
  1NASEA   NAVICULA SECRETA VAR. APICULATA                            55
  1SUANG   SURIRELLA ANGUSTATA                                        1
  1ACLAN   ACHNANTHES LANCEOLATA                                      3
  1FRAVA   FRAGILARIA VAUCHERIAE                                      3
  1NIHOL   NITZSCHIA HOLSATICA                                        28
  1NACRY   NAVICULA CRYPTOCEPHALA                                     2
  1NAPEL   NAVICULA PELLICULOSA                                       3
  1NANOT   NAVICULA NOTHA                                             2
  1NIACI   NITZSCHIA ACICULARIS                                       2
  1NAHAL   NAVICULA HALOPHILA                                         3
  1GOANG   GOMPHONEMA ANGUSTATUM                                      3
  1NASPP   NAVICULA SP.                                               1
  1NAHEU   NAVICULA HEUFLERI                                          2
  1NACIN   NAVICULA CINCTA                                            2
  4OSSPP   OSCILLATORIA SP.                                                               4


  4ANASP   ANABAENA SP.                                                                   2
  2PANSP   PANDORINA SP.                                                                  1
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STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 080180

C - 1180    V - 100 ML   DF - 1:49    L - 50 MM   W - 1    MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 65-132       ANALYST - RD

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                                                                           NUMBER COUNTED
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                                                                      DIATOMS            NON-DIATOMS
TAXON CODE   TAXON                                              PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  2PALCH    PALMELLA STAGE OF CHAETOPHORACEAE                                                 P
  1NILIN    NITZSCHIA LINEARIS                                          8
  1COCPL    COCCONEIS PLACENTULA                                        2
  1GYSPE    GYROSIGMA SPENCERII                                         P
  1CAAMP    CALONEIS AMPHISBAENA                                        P
  1NISIE    NITZSCHIA SIGMOIDEA                                         11
  1PIBOR    PINNULARIA BOREALIS                                         P
  1NASEA    NAVICULA SECRETA VAR. APICULATA                             54
  1NIDIS    NITZSCHIA DISSIPATA                                         64
  1NAVIR    NAVICULA VIRIDULA                                           100
  1NIFRU    NITZSCHIA FRUSTULUM                                         37
  1COCPE    COCCONEIS PEDICULUS                                         4
  1NIHUN    NITZSCHIA HUNGARICA                                         2
  1NIHOL    NITZSCHIA HOLSATICA                                         14
  1ACMIN    ACHNANTHES MINUTISSIMA                                      38
  1NACRY    NAVICULA CRYPTOCEPHALA                                      9
  1ACAFF    ACHNANTHES AFFINIS                                          8
  1ACLAN    ACHNANTHES LANCEOLATA                                       2
  1GOANG    GOMPHONEMA ANGUSTATUM                                       9
  1RHCUR    RHOICOSPHENIA CURVATA                                       2
  1NIPAL    NITZSCHIA PALEA                                             13
  1NICOM    NITZSCHIA COMMUNIS                                          1
  1NACRV    NAVICULA CRYPTOCEPHALA VAR. VENETA                          9
  1SYMIN    SYNEDRA MINUSCULA                                           2
  1FRAVA    FRAGILARIA VAUCHERIAE                                       3
  1ACMIC    ACHNANTHES MICROCEPHALA                                     3
  1CYMSI    CYMBELLA SINUATA                                            1
  1NAMEU    NAVICULA MENISCULUS VAR. UPSALIENSIS                        2
  1GOOLI    GOMPHONEMA OLIVACEUM                                        2
  1SUOVA    SURIRELLA OVATA                                             1
  1NARHY    NAVICULA RHYNCHOCEPHALA                                     1
  1NAPEL    NAVICULA PELLICULOSA                                        1
  4ANCIR    ANABAENA CIRCINALIS                                                               1

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STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 080180

C - 1590    V - 100 ML    DF - 1:49    L - 50 MM    W - 1    MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 66-132        ANALYST - RD

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                                                                            NUMBER COUNTED
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                                                                     DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                             PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                  P
  2OESPP   OEDOGONIUM SP.                                                                     P
  1CAAMP   CALONEIS AMPHISBAENA                                        P
  5EUSPP   EUGLENA SP.                                                                        P
  1GYSPE   GYROSIGMA SPENCERII                                         P
  1SYACU   SYNEDRA ACUS                                                P
  1SUOVA   SURIRELLA OVATA                                             6
  1NISIE   NITZSCHIA SIGMOIDEA                                         10
  1NIHUN   NITZSCHIA HUNGARICA                                         P
  1NAVIR   NAVICULA VIRIDULA                                           105
  1ACAFF   ACHNANTHES AFFINIS                                          10
  1ACMIN   ACHNANTHES MINUTISSIMA                                      22
  1NIDIS   NITZSCHIA DISSIPATA                                         93
  1NIFRU   NITZSCHIA FRUSTULUM                                         58
  1NASEA   NAVICULA SECRETA VAR. APICULATA                             45
  1NIHOL   NITZSCHIA HOLSATICA                                         7
  1NIPAL   NITZSCHIA PALEA                                             21
  1NAHAL   NAVICULA HALOPHILA                                          2
  1FRAVA   FRAGILARIA VAUCHERIAE                                       5
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                          2
  1NILIN   NITZSCHIA LINEARIS                                          2
  1ACMIC   ACHNANTHES MICROCEPHALA                                     4
  1NAMEU   NAVICULA MENISCULUS VAR. UPSALIENSIS                        4
  1NIACI   NITZSCHIA ACICULARIS                                        1
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                            4
  1HANAM   HANTZSCHIA AMPHIOXYS                                        1
  1GOANG   GOMPHONEMA ANGUSTATUM                                       3
  1NAHEU   NAVICULA HEUFLERI                                           1
  1GOOLI   GOMPHONEMA OLIVACEUM                                        2
  1CYCME   CYCLOTELLA MENEGHINIANA                                     1
  1NACRY   NAVICULA CRYPTOCEPHALA                                      2
  1NANOT   NAVICULA NOTHA                                              11
  1COCPL   COCCONEIS PLACENTULA                                        2
  1SYULN   SYNEDRA ULNA                                                1
  1NARHY   NAVICULA RHYNCHOCEPHALA                                     2
  4OSSPP   OSCILLATORIA SP.                                                                   2
  4ANASP   ANABAENA SP.                                                                       1

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STATION 2 - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 080180

C - 1576 V - 100 ML DF - 1:49 L - 50 MM W - 1 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 70-132 ANALYST - RD

TAXON CODE	TAXON	NUMBER COUNTED DIATOMS PROPORTIONAL COUNT	NUMBER COUNTED NON-DIATOMS SEDGWICK-RAFTER COUNT
2ULZON	ULOTHRIX ZONATA		1
4ANASP	ANABAENA SP.		P
1DIVUL	DIATOMA VULGARE	P	
2DRAPA	DRAPARNALDIA SP.		1
2CLOSP	CLOSTERIUM SP.		P
1GYSPE	GYROSIGMA SPENCERII	P	
1NAVIR	NAVICULA VIRIDULA	115	
1SUOVA	SURIRELLA OVATA	2	
1NISIE	NITZSCHIA SIGMOIDEA	7	
1SUOVL	SURIRELLA OVALIS	P	
2OESPP	OEDOGONIUM SP.		1
1NASEA	NAVICULA SECRETA VAR. APICULATA	55	
1NIPAL	NITZSCHIA PALEA	18	
1NAHEU	NAVICULA HEUFLERI	4	
1NACRV	NAVICULA CRYPTOCEPHALA VAR. VENETA	4	
1NIDIS	NITZSCHIA DISSIPATA	6	
1GOANG	GOMPHONEMA ANGUSTATUM	2	
1ACMIN	ACHNANTHES MINUTISSIMA	2	
1NARHY	NAVICULA RHYNCHOCEPHALA	7	
1NIHOL	NITZSCHIA HOLSATICA	17	
1NIHUN	NITZSCHIA HUNGARICA	1	
1GOOLI	GOMPHONEMA OLIVACEUM	2	
1NIFRU	NITZSCHIA FRUSTULUM	9	
1SYULN	SYNEDRA ULNA	1	
1RHCUR	RHOICOSPHENIA CURVATA	1	
1SUANG	SURIRELLA ANGUSTATA	2	
1NAEXI	NAVICULA EXIGUA	1	
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	1	
1SYMIN	SYNEDRA MINUSCULA	1	
1CYCME	CYCLOTELLA MENEGHINIANA	1	
2PEDTE	PEDIASTRUM TETRA		2

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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 080180


C - 1673    V - 100 ML    DF - 1:49    L - 50 MM    W - .69  MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 71-132        ANALYST - RD

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                                                                                 NUMBER COUNTED
                                                                                 --------------

                                                                      DIATOMS                NON-DIATOMS
TAXON CODE   TAXON                                              PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  2DRAPA   DRAPARNALDIA SP.                                                                13
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                               P
  2OESPP   OEDOGONIUM SP.                                                                  P
  1NISIE   NITZSCHIA SIGMOIDEA                                       8
  1SUOVA   SURIRELLA OVATA                                           P
  2CLOSP   CLOSTERIUM SP.                                                                  P
  4ANASP   ANABAENA SP.                                                                    1
  1PISPP   PINNULARIA SP.                                            P
  2COSMA   COSMARIUM SP.                                                                   P
  1CAAMP   CALONEIS AMPHISBAENA                                      P
  1NIACI   NITZSCHIA ACICULARIS                                      P
  1NIDIS   NITZSCHIA DISSIPATA                                       20
  1NIPAL   NITZSCHIA PALEA                                           83
  1NASEA   NAVICULA SECRETA VAR. APICULATA                           66
  1NAVIR   NAVICULA VIRIDULA                                         101
  1NIFRU   NITZSCHIA FRUSTULUM                                       11
  1GOOLI   GOMPHONEMA OLIVACEUM                                      4
  1NIHOL   NITZSCHIA HOLSATICA                                       58
  1NANOT   NAVICULA NOTHA                                            6
  1FRAVA   FRAGILARIA VAUCHERIAE                                     2
  1ACMIN   ACHNANTHES MINUTISSIMA                                    10
  1SUANG   SURIRELLA ANGUSTATA                                       1
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                        1
  1NARHY   NAVICULA RHYNCHOCEPHALA                                   7
  1CYMTU   CYMBELLA TUMIDA                                           1
  1ACLAN   ACHNANTHES LANCEOLATA                                     2
  1AMPER   AMPHORA PERPUSILLA                                        1
  1NAPEL   NAVICULA PELLICULOSA                                      2
  1SYMIN   SYNEDRA MINUSCULA                                         2
  1NILAT   NITZSCHIA LATENS                                          1
  1NAHAL   NAVICULA HALOPHILA                                        2
  1NAHEU   NAVICULA HEUFLERI                                         4
  1SYULN   SYNEDRA ULNA                                              1
  1GOANG   GOMPHONEMA ANGUSTATUM                                     2
  1HANAM   HANTZSCHIA AMPHIOXYS                                      1
  1FRACA   FRAGILARIA CAPUCINA                                       2
  1CYCME   CYCLOTELLA MENEGHINIANA                                   1
  1NITRL   NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                    1
  1NAMEU   NAVICULA MENISCULUS VAR. UPSALIENSIS                      1
  1COCPL   COCCONEIS PLACENTULA                                      1

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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3


REPLICATE - C
SAMPLE DATE - 080180

C - 1551    V - 100 ML    DF - 1:49    L - 50 MM    W - .68  MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 72-132        ANALYST - RD

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                                                                            NUMBER COUNTED
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                                                                   DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                          PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
------------------------------------------------------------------------------------------------------

  2DRAPA   DRAPARNALDIA SP.                                                              P
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                             P
  2CLOSP   CLOSTERIUM SP.                                                                P
  1NISIE   NITZSCHIA SIGMOIDEA                                    14
  2ULZON   ULOTHRIX ZONATA                                                               P
  1NAVIR   NAVICULA VIRIDULA                                      102
  1NASEA   NAVICULA SECRETA VAR. APICULATA                        82
  1NIPAL   NITZSCHIA PALEA                                        53
  1SUOVA   SURIRELLA OVATA                                        4
  1NANOT   NAVICULA NOTHA                                         8
  1GOOLI   GOMPHONEMA OLIVACEUM                                   13
  1SUOVL   SURIRELLA OVALIS                                       3
  1NIDIS   NITZSCHIA DISSIPATA                                    16
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                         2
  1GOANG   GOMPHONEMA ANGUSTATUM                                  5
  1NARHY   NAVICULA RHYNCHOCEPHALA                                6
  1NACRY   NAVICULA CRYPTOCEPHALA                                 6
  1ACMIN   ACHNANTHES MINUTISSIMA                                 3
  1NIFRU   NITZSCHIA FRUSTULUM                                    16
  1ACLAN   ACHNANTHES LANCEOLATA                                  3
  1NIHOL   NITZSCHIA HOLSATICA                                    25
  1NICOM   NITZSCHIA COMMUNIS                                     1
  1CYMSI   CYMBELLA SINUATA                                       1
  1NAHEU   NAVICULA HEUFLERI                                      8
  1NAPEL   NAVICULA PELLICULOSA                                   5
  1HANAM   HANTZSCHIA AMPHIOXYS                                   1
  1STAST   STEPHANODISCUS ASTREA                                  2
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                     7
  1PISPP   PINNULARIA SP.                                         1
  1RHGIB   RHOPALODIA GIBBERULA                                   1
  1NIHUN   NITZSCHIA HUNGARICA                                    5
  1CYCME   CYCLOTELLA MENEGHINIANA                                1
  1SYACU   SYNEDRA ACUS                                           2
  1GOINT   GOMPHONEMA INTRICATUM                                  1
  1NAEXI   NAVICULA EXIGUA                                        1
  1SYULN   SYNEDRA ULNA                                           5
  1NILIN   NITZSCHIA LINEARIS                                     4
  1NIACI   NITZSCHIA ACICULARIS                                   1
  1DIHIM   DIATOMA HIEMALE VAR. MESODON                           1

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3


REPLICATE - A
SAMPLE DATE - 080180

C - 637      V - 100 ML   DF - 1149    L - 50 MM   W - 1    MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 76-132       ANALYST - RD

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                                                                              NUMBER COUNTED
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                                                                         DIATOMS             NON-DIATOMS
TAXON CODE   TAXON                                                 PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
---------------------------------------------------------------   ----------------------------------------

  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                       P
  1NISIE   NITZSCHIA SIGMOIDEA                                            5
  1SUOVL   SURIRELLA OVALIS                                               P
  1CAAMP   CALONEIS AMPHISBAENA                                           P
  1NAVIR   NAVICULA VIRIDULA                                              196
  1NIHUN   NITZSCHIA HUNGARICA                                            4
  1CYMSI   CYMBELLA SINUATA                                               1
  1NASEA   NAVICULA SECRETA VAR. APICULATA                                19
  1SUANG   SURIRELLA ANGUSTATA                                            1
  1NAHEU   NAVICULA HEUFLERI                                              3
  1NIPAL   NITZSCHIA PALEA                                                6
  1GYSPE   GYROSIGMA SPENCERII                                            1
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                                 1
  1CYCME   CYCLOTELLA MENEGHINIANA                                        1
  1SUOVA   SURIRELLA OVATA                                                3
  1NIDIS   NITZSCHIA DISSIPATA                                            9
  1ACMIN   ACHNANTHES MINUTISSIMA                                         1
  1GOANG   GOMPHONEMA ANGUSTATUM                                          1
  1NICOM   NITZSCHIA COMMUNIS                                             1
  1ACLAN   ACHNANTHES LANCEOLATA                                          1
  1RHMUS   RHOPALODIA MUSCULUS                                            1
  1NIFRU   NITZSCHIA FRUSTULUM                                            6
  1RHCUR   RHOICOSPHENIA CURVATA                                          1
  1NESPP   NEIDIUM SP.                                                    1
  1NAPEL   NAVICULA PELLICULOSA                                           1

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 080180

C - 692     V - 100 ML   DF - 1:49    L - 50 MM    W - 1    MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 77-132       ANALYST - RD

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                                                                          NUMBER COUNTED
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                                                                        DIATOMS            NON-DIATOMS
TAXON CODE   TAXON                                               PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  2DRAPA   DRAPARNALDIA SP.                                                                 2
  1CAAMP   CALONEIS AMPHISBAENA                                          P
  1GYSPE   GYROSIGMA SPENCERII                                           1
  1NAVIR   NAVICULA VIRIDULA                                             165
  1NIPAL   NITZSCHIA PALEA                                               8
  1NASEA   NAVICULA SECRETA VAR. APICULATA                               25
  1NIDIS   NITZSCHIA DISSIPATA                                           10
  1NIFRU   NITZSCHIA FRUSTULUM                                           7
  1COCPL   COCCONEIS PLACENTULA                                          1
  1NAMEU   NAVICULA MENISCULUS VAR. UPSALIENSIS                          2
  1ACMIN   ACHNANTHES MINUTISSIMA                                        5
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                            1
  1SUOVA   SURIRELLA OVATA                                               1
  1NILIN   NITZSCHIA LINEARIS                                            2
  1ACAFF   ACHNANTHES AFFINIS                                            3
  1NARHY   NAVICULA RHYNCHOCEPHALA                                       1
  1NIHUN   NITZSCHIA HUNGARICA                                           1
  1GOANG   GOMPHONEMA ANGUSTATUM                                         2
  1DIVUL   DIATOMA VULGARE                                               1
  1ACLAN   ACHNANTHES LANCEOLATA                                         2
  1FRAVA   FRAGILARIA VAUCHERIAE                                         1
  1GOOLI   GOMPHONEMA OLIVACEUM                                          2
  1NAHEU   NAVICULA HEUFLERI                                             2
  1NIHOL   NITZSCHIA HOLSATICA                                           2
  1NISIE   NITZSCHIA SIGMOIDEA                                           3
  1HANAM   HANTZSCHIA AMPHIOXYS                                          2
  1SYULN   SYNEDRA ULNA                                                  1
  1CYCME   CYCLOTELLA MENEGHINIANA                                       1

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 080180

C - 613      V - 100 ML   DF - 1:49    L - 50 MM    W - 1    MM    D - 1  MM    S - 2     A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 78-132         ANALYST - RD

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                                                                                      NUMBER COUNTED
                                                                                      --------------

                                                                                 DIATOMS            NON-DIATOMS
TAXON.CODE   TAXON                                                          PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
------------------------------------------------------------------------------------------------------------

  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                          P
  2DRAPA   DRAPARNALDIA SP.                                                                           P
  2MOUSP   MOUGEOTIA SP.                                                                              P
  2STITE   STIGEOCLONIUM TENUE                                                                        P
  1NISIE   NITZSCHIA SIGMOIDEA                                                      3


  1NAVIR   NAVICULA VIRIDULA                                                        164
  1NASEA   NAVICULA SECRETA VAR. APICULATA                                          28
  1SUOVA   SURIRELLA OVATA                                                          1
  1SYULN   SYNEDRA ULNA                                                             1
  1SUANG   SURIRELLA ANGUSTATA                                                      1
  1NIPAL   NITZSCHIA PALEA                                                          11
  1ACMIN   ACHNANTHES MINUTISSIMA                                                   3
  1NIDIS   NITZSCHIA DISSIPATA                                                      17
  1NAHEU   NAVICULA HEUFLERI                                                        4
  1NIFRU   NITZSCHIA FRUSTULUM                                                      14
  1SYMIN   SYNEDRA MINUSCULA                                                        1
  1ACLAN   ACHNANTHES LANCEOLATA                                                    4
  1RHCUR   RHOICOSPHENIA CURVATA                                                    1
  1PIBOR   PINNULARIA BOREALIS                                                      1
  1SUOVL   SURIRELLA OVALIS                                                         P
  1COCPE   COCCONEIS PEDICULUS                                                      1
  1NITRL   NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                                   P
  1NIHUN   NITZSCHIA HUNGARICA                                                      P
  1GYSPE   GYROSIGMA SPENCERII                                                      P
  1NACRY   NAVICULA CRYPTOCEPHALA                                                   2
  1GOOLI   GOMPHONEMA OLIVACEUM                                                     3
  1GOPAR   GOMPHONEMA PARVULUM                                                      1
  1ACAFF   ACHNANTHES AFFINIS                                                       1
  1NAPUP   NAVICULA PUPULA                                                          1
  1NIHOL   NITZSCHIA HOLSATICA                                                      3

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SEPTEMBER (9/02/80)

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PERIPHYTON BENCH SHEET
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CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 090280

C - 1581    V - 125 ML    DF - 1:19    L - 50 MM    W - .68  MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 91-132       ANALYST - RD

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                                                                          NUMBER COUNTED
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                                                                      DIATOMS            NON-DIATOMS
TAXON CODE   TAXON                                             PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1COCPL   COCCONEIS PLACENTULA                                       12
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                12
  2CLASP   CLADOPHORA SP.                                                                   P
  1NAVIR   NAVICULA VIRIDULA                                          5
  1RHCUR   RHOICOSPHENIA CURVATA                                      P
  1ASFOR   ASTERIONELLA FORMOSA                                       P
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                             4
  1ACLAN   ACHNANTHES LANCEOLATA                                      9
  1ACMIN   ACHNANTHES MINUTISSIMA                                     113
  1NIDIS   NITZSCHIA DISSIPATA                                        72
  1CYMSI   CYMBELLA SINUATA                                           12
  1NANOT   NAVICULA NOTHA                                             1
  1NAMEU   NAVICULA MENISCULUS VAR. UPSALIENSIS                       9
  1GOANG   GOMPHONEMA ANGUSTATUM                                      17
  1NIPAL   NITZSCHIA PALEA                                            3
  1AMPER   AMPHORA PERPUSILLA                                         1
  1NARHY   NAVICULA RHYNCHOCEPHALA                                    1
  1NIFRU   NITZSCHIA FRUSTULUM                                        10
  1SUOVA   SURIRELLA OVATA                                            1
  1NAGRA   NAVICULA GRACILOIDES                                       10
  1FRAVA   FRAGILARIA VAUCHERIAE                                      1
  1NASEA   NAVICULA SECRETA VAR. APICULATA                            1
  1SYMIN   SYNEDRA MINUSCULA                                          1
  1GOSUB   GOMPHONEMA SUBCLAVATUM                                     P
  1EPSOR   EPITHEMIA SOREX                                            P
  1GOOLI   GOMPHONEMA OLIVACEUM                                       P
  1NIHUN   NITZSCHIA HUNGARICA                                        P
  1NILIN   NITZSCHIA LINEARIS                                         P
  4ANASP   ANABAENA SP.                                                                     1

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STATION 1 - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 090280

C - 1233 V - 125 ML DF - 1:19 L - 50 MM W - .68 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 92-132 ANALYST - RD

TAXON CODE	TAXON	NUMBER COUNTED DIATOMS PROPORTIONAL COUNT	NON-DIATOMS SEDGWICK-RAFTER COUNT
1COCPL	COCCONEIS PLACENTULA	7	
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		72
1ASFOR	ASTERIONELLA FORMOSA	P	
1NAVIR	NAVICULA VIRIDULA	5	
1NAMUT	NAVICULA MUTICA	1	
1NIDIS	NITZSCHIA DISSIPATA	69	
1NIPAL	NITZSCHIA PALEA	4	
1NAHEU	NAVICULA HEUFLERI	5	
1AMPER	AMPHORA PERPUSILLA	4	
1ACMIN	ACHNANTHES MINUTISSIMA	110	
1RHCUR	RHOICOSPHENIA CURVATA	1	
1NAMEU	NAVICULA MENISCULUS VAR. UPSALIENSIS	3	
1GOOLI	GOMPHONEMA OLIVACEUM	3	
1RHGIB	RHOPALODIA GIBBERULA	2	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	3	
1ACLAN	ACHNANTHES LANCEOLATA	5	
1NATSC	NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES	1	
1NIFRU	NITZSCHIA FRUSTULUM	22	
1NASEA	NAVICULA SECRETA VAR. APICULATA	2	
1GOSUB	GOMPHONEMA SUBCLAVATUM	5	
1GOANG	GOMPHONEMA ANGUSTATUM	8	
1CYMSI	CYMBELLA SINUATA	2	
1FRAVA	FRAGILARIA VAUCHERIAE	P	
1SUOVA	SURIRELLA OVATA	P	
1NIHUN	NITZSCHIA HUNGARICA	P	
4OSSPP	OSCILLATORIA SP.		1
4ANASP	ANABAENA SP.		1

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STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 090280

C - 1384    V - 125 ML   DF - 1:19    L - 50 MM   W - .68  MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 93-132        ANALYST - RD

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                                                                              NUMBER COUNTED

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                                                                          DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                                  PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
------------------------------------------------------------------------------------------------------

  1COCPL   COCCONEIS PLACENTULA                                             3
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                     89
  1CAAMP   CALONEIS AMPHISBAENA                                             P
  1NAVIR   NAVICULA VIRIDULA                                                4
  1ASFOR   ASTERIONELLA FORMOSA                                             P
  1RHCUR   RHOICOSPHENIA CURVATA                                            P
  1NIHUN   NITZSCHIA HUNGARICA                                              1
  1NIFRU   NITZSCHIA FRUSTULUM                                              14
  1NIDIS   NITZSCHIA DISSIPATA                                              102
  1ACMIN   ACHNANTHES MINUTISSIMA                                           149
  1GOANG   GOMPHONEMA ANGUSTATUM                                            3
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                               5
  1GOOLI   GOMPHONEMA OLIVACEUM                                             1
  1CYMMI   CYMBELLA MINUTA                                                  2
  1NIPAL   NITZSCHIA PALEA                                                  4
  1NAHEU   NAVICULA HEUFLERI                                                1
  1AMPER   AMPHORA PERPUSILLA                                               1
  1ACLAN   ACHNANTHES LANCEOLATA                                            2
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                                   P
  1SUOVA   SURIRELLA OVATA                                                  P
  1NATSC   NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES                         P
  1GOSUB   GOMPHONEMA SUBCLAVATUM                                           P
  1DEELE   DENTICULA ELEGANS                                                P

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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 090280

C - 719     V - 125 ML   DF - 1:19    L - 50 MM    W - .68  MM    D - 1  MM    S - 2     A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 94-132        ANALYST - RD

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                                                                         NUMBER COUNTED
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                                                                      DIATOMS             NON-DIATOMS
TAXON CODE   TAXON                                              PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1COCPL   COCCONEIS PLACENTULA                                         84
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                  29
  1NATSC   NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES                     1
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                               8
  1ACLAN   ACHNANTHES LANCEOLATA                                        32
  1ACMIN   ACHNANTHES MINUTISSIMA                                       123
  1NASEA   NAVICULA SECRETA VAR. APICULATA                              3
  1CYMSI   CYMBELLA SINUATA                                             1
  1NAVIR   NAVICULA VIRIDULA                                            6


  1GOOLI   GOMPHONEMA OLIVACEUM                                         1
  1NANOT   NAVICULA NOTHA                                               1
  1CYMMI   CYMBELLA MINUTA                                              1
  1NIPAL   NITZSCHIA PALEA                                              1
  1NIDIS   NITZSCHIA DISSIPATA                                          1
  1CYMTU   CYMBELLA TUMIDA                                              P
  1COCPE   COCCONEIS PEDICULUS                                          P
  1NILIN   NITZSCHIA LINEARIS                                           P
  1GOSUB   GOMPHONEMA SUBCLAVATUM                                       P
  1ASFOR   ASTERIONELLA FORMOSA                                         P
  1NIDIS   NITZSCHIA DISSIPATA                                          P
  1NARHY   NAVICULA RHYNCHOCEPHALA                                      P
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                             P
  1AMVEN   AMPHORA VENETA                                               P
  1SUOVA   SURIRELLA OVATA                                              P
  1CYCME   CYCLOTELLA MENEGHINIANA                                      P
  1RHGIV   RHOPALODIA GIBBA                                             P
  4ANASP   ANABAENA SP.                                                                       1
  4MESPP   MERISMOPEDIA SP.                                                                   1
  1AMPER   AMPHORA PERPUSILLA                                           P

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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 090280

C - 1065     V - 125 ML    DF - 1:19     L - 50 MM     W - .68  MM    D - 1  MM    S - 2     A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 95-132        ANALYST - RD

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                                                                           NUMBER COUNTED
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                                                                     DIATOMS               NON-DIATOMS
TAXON CODE   TAXON                                             PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                   138
  1RHCUR   RHOICOSPHENIA CURVATA                                      P
  1COCPL   COCCONEIS PLACENTULA                                       75
  1GYSPE   GYROSIGMA SPENCERII                                        P
  1ACLAN   ACHNANTHES LANCEOLATA                                      20
  1NIDIS   NITZSCHIA DISSIPATA                                        13
  1NASEA   NAVICULA SECRETA VAR. APICULATA                            5
  1ACMIN   ACHNANTHES MINUTISSIMA                                     137
  1NAVIR   NAVICULA VIRIDULA                                          7
  1NIFRU   NITZSCHIA FRUSTULUM                                        1
  1CYMMI   CYMBELLA MINUTA                                            1
  1CYMSI   CYMBELLA SINUATA                                           5
  1NAARV   NAVICULA ARVENSIS                                          1
  1NIPAL   NITZSCHIA PALEA                                            1
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                           6
  1COCPE   COCCONEIS PEDICULUS                                        1
  1SYMIN   SYNEDRA MINUSCULA                                          P
  1GOOLI   GOMPHONEMA OLIVACEUM                                       P


  1GOANG   GOMPHONEMA ANGUSTATUM                                      P
  1GOSUB   GOMPHONEMA SUBCLAVATUM                                     P
  1FRACA   FRAGILARIA CAPUCINA                                        P
  1SYULN   SYNEDRA ULNA                                               P

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STATION 2 - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 090280

C - 1218 V - 125 ML DF - 1:19 L - 50 MM W - .68 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 96-132 ANALYST - RD

		NUMBER COUNTED	
TAXON CODE	TAXON	DIATOMS PROPORTIONAL COUNT	NON-DIATOMS SEDGWICK-RAFTER COUNT
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		49
2STITE	STIGEOCLONIUM TENUE		2
4PHSPP	PHORMIDIUM SP.		12
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	21	
1NIDIS	NITZSCHIA DISSIPATA	9	
1ACMIN	ACHNANTHES MINUTISSIMA	180	
1NIFRU	NITZSCHIA FRUSTULUM	7	
1GOANG	GOMPHONEMA ANGUSTATUM	P	
1NAVIR	NAVICULA VIRIDULA	3	
1CYMSI	CYMBELLA SINUATA	7	
1CYMTU	CYMBELLA TUMIDA	6	
1COCPL	COCCONEIS PLACENTULA	34	
1NANOT	NAVICULA NOTHA	2	
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	17	
1NASEA	NAVICULA SECRETA VAR. APICULATA	6	
1NAISC	NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES	1	
1ACLAN	ACHNANTHES LANCEOLATA	23	
1NIPAL	NITZSCHIA PALEA	2	
1GOOLI	GOMPHONEMA OLIVACEUM	P	
1COCPE	COCCONEIS PEDICULUS	P	
1SUANG	SURIRELLA ANGUSTATA	P	
1NIHUN	NITZSCHIA HUNGARICA	P	
1ACAFF	ACHNANTHES AFFINIS	P	
1AMPER	AMPHORA PERPUSILLA	P	
1ACMIC	ACHNANTHES MICROCEPHALA	P	
1NIHOL	NITZSCHIA HOLSATICA	P	
1RHCUR	RHOICOSPHENIA CURVATA	P	
2SPISP	SPIROGYRA SP.		3
1ASFOR	ASTERIONELLA FORMOSA	P	

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 090280

C - 1303    V - 125 ML   DF - 1:19    L - 50 MM   W - .68  MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 97-132        ANALYST - RD

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                                                                                 NUMBER COUNTED
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                                                                        DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                                 PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                              1
  1COCPE   COCCONEIS PEDICULUS                                             3
  1NITRL   NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                          P
  1GOANG   GOMPHONEMA ANGUSTATUM                                           P
  1RHCUR   RHOICOSPHENIA CURVATA                                           P
  1NILIN   NITZSCHIA LINEARIS                                              P
  1NISIE   NITZSCHIA SIGMOIDEA                                             P
  1SUOVA   SURIRELLA OVATA                                                 P
  2PANSP   PANDORINA SP.                                                                    5
  1COCPL   COCCONEIS PLACENTULA                                            11
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                81
  1NAVIR   NAVICULA VIRIDULA                                               7
  1DIVUL   DIATOMA VULGARE                                                 P
  1NIDIS   NITZSCHIA DISSIPATA                                             41
  1AMPER   AMPHORA PERPUSILLA                                              7
  1ACMIN   ACHNANTHES MINUTISSIMA                                          150
  1ACMIC   ACHNANTHES MICROCEPHALA                                         3
  1ACLAN   ACHNANTHES LANCEOLATA                                           10
  1NASEA   NAVICULA SECRETA VAR. APICULATA                                 7
  1GOOLI   GOMPHONEMA OLIVACEUM                                            1
  1NAPEL   NAVICULA PELLICULOSA                                            3
  1NIFRU   NITZSCHIA FRUSTULUM                                             13
  1CYMMI   CYMBELLA MINUTA                                                 1
  1NIPAL   NITZSCHIA PALEA                                                 5
  1CYMSI   CYMBELLA SINUATA                                                1
  1ACAFF   ACHNANTHES AFFINIS                                              10

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STATION 3 - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 090280

C - 1278 V - 125 ML DF - 1:19 L - 50 MM W - .68 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 98-132 ANALYST - RD

		NUMBER COUNTED	
TAXON CODE	TAXON	DIATOMS PROPORTIONAL COUNT	NON-DIATOMS SEDGWICK-RAFTER COUNT
1COCPL	COCCONEIS PLACENTULA	20	
1NAVIR	NAVICULA VIRIDULA	15	
1RHCUR	RHOICOSPHENIA CURVATA	P	
4PHSPP	PHORMIDIUM SP.		2
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	P	
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		196
4OSSPP	OSCILLATORIA SP.		P
2CLAGL	CLADOPHORA GLOMERATA		P
1NAHEU	NAVICULA HEUFLERI	1	
1ACLAN	ACHNANTHES LANCEOLATA	17	
1NIFRU	NITZSCHIA FRUSTULUM	17	
1NIDIS	NITZSCHIA DISSIPATA	14	
1ACMIN	ACHNANTHES MINUTISSIMA	156	
1NIPAL	NITZSCHIA PALEA	4	
1AMPER	AMPHORA PERPUSILLA	12	
1NATSC	NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES	1	
1COCPE	COCCONEIS PEDICULUS	2	
1NIHOL	NITZSCHIA HOLSATICA	10	
1GOSUB	GOMPHONEMA SUBCLAVATUM	P	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	2	
1FRAVA	FRAGILARIA VAUCHERIAE	P	
1SYULN	SYNEDRA ULNA	P	
1NIDEN	NITZSCHIA DENTICULA	P	
1NASEA	NAVICULA SECRETA VAR. APICULATA	4	
1SULIN	SURIRELLA LINEARIS	P	
1GOOLI	GOMPHONEMA OLIVACEUM	1	
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	2	
1ACMIC	ACHNANTHES MICROCEPHALA	1	
1CYCME	CYCLOTELLA MENEGHINIANA	1	
1CYMSI	CYMBELLA SINUATA	3	
1CYMMI	CYMBELLA MINUTA	2	
1NAMEU	NAVICULA MENISCULUS VAR. UPSALIENSIS	2	
1NAPEL	NAVICULA PELLICULOSA	3	

STATION 3 - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 090280

C - 1137   V - 125 ML   DF - I:19   L - 50 MM   W - .68 MM   D - 1 MM   S - 2   A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 99-I32   ANALYST - RD

		NUMBER COUNTED	
TAXON CODE	TAXON	DIATOMS PROPORTIONAL COUNT	NON-DIATOMS SEDGWICK-RAFTER COUNT
1COCPL	COCCONEIS PLACENTULA	19	
1NAVIR	NAVICULA VIRIDULA	14	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	1	
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		173
1ASFOR	ASTERIONELLA FORMOSA	P	
1SUOVL	SURIRELLA OVALIS	P	
1GOANG	GOMPHONEMA ANGUSTATUM	2	
1NIDIS	NITZSCHIA DISSIPATA	36	
1NIFRU	NITZSCHIA FRUSTULUM	4	
1ACMIN	ACHNANTHES MINUTISSIMA	170	
1AMPER	AMPHORA PERPUSILLA	P	
1ACLAN	ACHNANTHES LANCEOLATA	16	
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	2	
1COCPE	COCCONEIS PEDICULUS	2	
1NIPAL	NITZSCHIA PALEA	3	
1NASEA	NAVICULA SECRETA VAR. APICULATA	1	
1NARHY	NAVICULA RHYNCHOCEPHALA	P	
1GOOLI	GOMPHONEMA OLIVACEUM	P	
1CYMMI	CYMBELLA MINUTA	P	
1DEELE	DENTICULA ELEGANS	P	
1CYCME	CYCLOTELLA MENEGHINIANA	1	
1DIVUL	DIATOMA VULGARE	P	
1CYMTU	CYMBELLA TUMIDA	P	
1NILIN	NITZSCHIA LINEARIS	P	
1RHCUR	RHOICOSPHENIA CURVATA	P	
1AMVEN	AMPHORA VENETA	P	
1NIHUN	NITZSCHIA HUNGARICA	P	
1NAHEU	NAVICULA HEUFLERI	P	
1NIDEN	NITZSCHIA DENTICULA	P	
1GOACU	GOMPHONEMA ACUMINATUM	P	
1NIHOL	NITZSCHIA HOLSATICA	2	
1NAMEU	NAVICULA MENISCULUS VAR. UPSALIENSIS	3	
1NAPEL	NAVICULA PELLICULOSA	8	
1NACRV	NAVICULA CRYPTOCEPHALA VAR. VENETA	1	
1FRAVA	FRAGILARIA VAUCHERIAE	1	

SEPTEMBER (9/29/80)

PERIPHYTON BENCH SHEET

CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

STATION 1 - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 092980

C - 2480   V - 100 ML   DF - 1:0   L - 50 MM   W - .34 MM   D - 1 MM   S - 2   A - 3750 MM2
SUBSTRATE - GLASS SLIDE-NEW

LOG NUMBER - 141-132   ANALYST - RD

TAXON CODE	TAXON	NUMBER COUNTED DIATOMS PROPORTIONAL COUNT	NUMBER COUNTED NON-DIATOMS SEDGWICK-RAFTER COUNT
1COCPL	COCCONEIS PLACENTULA	105	
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		15
1NAVIA	NAVICULA VIRIDULA VAR. AVENACEA	3	
1GYSPE	GYROSIGMA SPENCERII	P	
1EPSOR	EPITHEMIA SOREX	2	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	P	
2CHAPR	BULBOCHAETA SP.		1
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	87	
1ACMIN	ACHNANTHES MINUTISSIMA	76	
1NILIN	NITZSCHIA LINEARIS	1	
1NIDIS	NITZSCHIA DISSIPATA	5	
1NASEA	NAVICULA SECRETA VAR. APICULATA	2	
1RHCUR	RHOICOSPHENIA CURVATA	1	
1NIFRU	NITZSCHIA FRUSTULUM	4	
1GOOLI	GOMPHONEMA OLIVACEUM	2	
1CYMSI	CYMBELLA SINUATA	3	
1AMPER	AMPHORA PERPUSILLA	11	
1NAHEU	NAVICULA HEUFLERI	2	
1HANAM	HANTZSCHIA AMPHIOXYS	1	
1GOACU	GOMPHONEMA ACUMINATUM	1	
1NACRY	NAVICULA CRYPTOCEPHALA	1	
1GOPAR	GOMPHONEMA PARVULUM	1	
1CYCME	CYCLOTELLA MENEGHINIANA	1	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	3	
1GOSUB	GOMPHONEMA SUBCLAVATUM	P	

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STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 092980

C - 173     V - 100 ML    DF - 1:19    L - 50 MM    W - .34  MM    D - 1  MM    S - 2    A - 3750 MM2


SUBSTRATE - GLASS SLIDE-NEW

LOG NUMBER - 142-132      ANALYST - RD

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                                                              NUMBER COUNTED
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                                                             DIATOMS            NON-DIATOMS
TAXON CODE   TAXON                                      PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1COCPL   COCCONEIS PLACENTULA                                101
  1CYMMI   CYMBELLA MINUTA                                     P
  1EPSOR   EPITHEMIA SOREX                                     1
  1NAVIA   NAVICULA VIRIDULA VAR. AVENACEA                     5
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                        4
  1ACMIN   ACHNANTHES MINUTISSIMA                              50
  1NIDIS   NITZSCHIA DISSIPATA                                 34
  1COCPE   COCCONEIS PEDICULUS                                 3
  1NILIN   NITZSCHIA LINEARIS                                  1
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                    9
  1NAGRA   NAVICULA GRACILOIDES                                2
  1NIFRU   NITZSCHIA FRUSTULUM                                 4
  1GOOLI   GOMPHONEMA OLIVACEUM                                1
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                      1
  1CYCME   CYCLOTELLA MENEGHINIANA                             1
  1NALAN   NAVICULA LANCEOLATA                                 1
  1NARHY   NAVICULA RHYNCHOCEPHALA                             P
  1GYSPE   GYROSIGMA SPENCERII                                 P
  1NASEA   NAVICULA SECRETA VAR. APICULATA                     P
  1GOPAR   GOMPHONEMA PARVULUM                                 P
  1GOSUB   GOMPHONEMA SUBCLAVATUM                              P
  1SYFAS   SYNEDRA FASCICULATA                                 P

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STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 092980

C - 79      V - 100 ML   DF - 1:19    L - 50 MM   W - .34  MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDE-NEW

LOG NUMBER - 143-132       ANALYST - RD

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                                                                          NUMBER COUNTED
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                                                                    DIATOMS               NON-DIATOMS
TAXON CODE   TAXON                                            PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1COCPL   COCCONEIS PLACENTULA                                       103
  1NAVIA   NAVICULA VIRIDULA VAR. AVENACEA                            4
  1ACMIN   ACHNANTHES MINUTISSIMA                                     70


  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                           14
  1NIDIS   NITZSCHIA DISSIPATA                                        23
  1NIFRU   NITZSCHIA FRUSTULUM                                        2
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                             2
  1SYULN   SYNEDRA ULNA                                               1
  1CYMSI   CYMBELLA SINUATA                                           1
  1GOACU   GOMPHONEMA ACUMINATUM                                      1
  1NASEA   NAVICULA SECRETA VAR. APICULATA                            1
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                         10
  1GOOLI   GOMPHONEMA OLIVACEUM                                       1
  1ACLAN   ACHNANTHES LANCEOLATA                                      1
  1NILIN   NITZSCHIA LINEARIS                                         P
  1CYMTU   CYMBELLA TUMIDA                                            P
  1SUOVA   SURIRELLA OVATA                                            P
  1NISPP   NITZSCHIA SP.                                              P
  1SYMIN   SYNEDRA MINUSCULA                                          P
  1NIPAL   NITZSCHIA PALEA                                            P
  1FRAVA   FRAGILARIA VAUCHERIAE                                      P

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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 092980

C - 1045    V - 100 ML   DF - 1:19    L - 50 MM    W - .34  MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDE-NEW

LOG NUMBER - 144-132       ANALYST - RD

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                                                                          NUMBER COUNTED
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                                                                    DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                            PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                            50
  1COCPL   COCCONEIS PLACENTULA                                     17
  4MESPP   MERISMOPEDIA SP.                                                             P
  4ANSPP   ANACYSTIS SP.                                                                P
  1RHCUR   RHOICOSPHENIA CURVATA                                    P
  1ACMIN   ACHNANTHES MINUTISSIMA                                   118
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                         29
  1NACRY   NAVICULA CRYPTOCEPHALA                                   7
  1GOOLI   GOMPHONEMA OLIVACEUM                                     9
  1CYMSI   CYMBELLA SINUATA                                         3
  1COCPE   COCCONEIS PEDICULUS                                      1
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                           4
  1GOSUB   GOMPHONEMA SUBCLAVATUM                                   1
  1NAVIA   NAVICULA VIRIDULA VAR. AVENACEA                          6
  1FRAVA   FRAGILARIA VAUCHERIAE                                    2
  1GOPAR   GOMPHONEMA PARVULUM                                      P
  1SYULN   SYNEDRA ULNA                                             P
  1NIPAL   NITZSCHIA PALEA                                          P
  1FRACR   FRAGILARIA CROTONENSIS                                   P
  1NASEA   NAVICULA SECRETA VAR. APICULATA                          P


  1NIDIS   NITZSCHIA DISSIPATA                                      P
  1CYCME   CYCLOTELLA MENEGHINIANA                                  P
  1NIACI   NITZSCHIA ACICULARIS                                     P

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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 092980

C - 429     V - 100 ML    DF - 1:19    L - 50 MM    W - .34  MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDE-NEW

LOG NUMBER - 145-132       ANALYST - RD

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                                                                            NUMBER COUNTED
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                                                                         DIATOMS             NON-DIATOMS
TAXON CODE    TAXON                                                 PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1COCPL   COCCONEIS PLACENTULA                                            35
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                    22
  4ANSPP   ANACYSTIS SP.                                                                        P
  1NAVIA   NAVICULA VIRIDULA VAR. AVENACEA                                 1
  1CYELL   CYMATOPLEURA ELLIPTICA                                          P
  1SUOVL   SURIRELLA OVALIS                                                P
  1ACMIN   ACHNANTHES MINUTISSIMA                                          100
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                                  3
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                                21
  1NACRY   NAVICULA CRYPTOCEPHALA                                          2
  1NIDIS   NITZSCHIA DISSIPATA                                             14
  1NITRL   NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS                          1
  1NILIN   NITZSCHIA LINEARIS                                              1
  1AMPER   AMPHORA PERPUSILLA                                              2
  1NIHUN   NITZSCHIA HUNGARICA                                             2
  1COCPE   COCCONEIS PEDICULUS                                             1
  1NIFRU   NITZSCHIA FRUSTULUM                                             1
  1GOOLI   GOMPHONEMA OLIVACEUM                                            1
  1SUANG   SURIRELLA ANGUSTATA                                             P
  1DIVUL   DIATOMA VULGARE                                                 P
  1SYULN   SYNEDRA ULNA                                                    P
  1CYMSI   CYMBELLA SINUATA                                                P
  1CYCME   CYCLOTELLA MENEGHINIANA                                         P
  1GOPAR   GOMPHONEMA PARVULUM                                             P
  1ACLAN   ACHNANTHES LANCEOLATA                                           P
  1NASEA   NAVICULA SECRETA VAR. APICULATA                                 P
  1NARHY   NAVICULA RHYNCHOCEPHALA                                         P
  1NAARV   NAVICULA ARVENSIS                                               P
  1SYMIN   SYNEDRA MINUSCULA                                               P
  1HANAM   HANTZSCHIA AMPHIOXYS                                            P

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STATION 2 - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 092980

C - 888 V - 100 ML DF - 1:19 L - 50 MM W - .34 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDE-NEW

LOG NUMBER - 146-132 ANALYST - RD

TAXON CODE	TAXON	NUMBER COUNTED DIATOMS PROPORTIONAL COUNT	NUMBER COUNTED NON-DIATOMS SEDGWICK-RAFTER COUNT
1COCPL	COCCONEIS PLACENTULA	24	
4OSSPP	OSCILLATORIA SP.		P
3VAUSP	VAUCHERIA SP.		P
2CLASP	CLADOPHORA SP.		P
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		40
1RHCUR	RHOICOSPHENIA CURVATA	P	
5EUARC	EUGLENA ARCUS		1
2STITE	STIGEOCLONIUM TENUE		P
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	11	
1ACMIN	ACHNANTHES MINUTISSIMA	112	
1NIFRU	NITZSCHIA FRUSTULUM	4	
1ACLAN	ACHNANTHES LANCEOLATA	3	
1GOOLI	GOMPHONEMA OLIVACEUM	4	
1NACRY	NAVICULA CRYPTOCEPHALA	3	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	1	
1CYMMI	CYMBELLA MINUTA	1	
1FRAVA	FRAGILARIA VAUCHERIAE	2	
1CYMSI	CYMBELLA SINUATA	1	
1SUOVA	SURIRELLA OVATA	1	
1NAVIA	NAVICULA VIRIDULA VAR. AVENACEA	1	
1CYMAF	CYMBELLA AFFINIS	P	
1NASEA	NAVICULA SECRETA VAR. APICULATA	P	
1COCPE	COCCONEIS PEDICULUS	P	
1NIAPI	NITZSCHIA APICULATA	P	
1NIDIS	NITZSCHIA DISSIPATA	P	
1NACRV	NAVICULA CRYPTOCEPHALA VAR. VENETA	P	
1GOPAR	GOMPHONEMA PARVULUM	P	
1NIHUN	NITZSCHIA HUNGARICA	P	
1NIPAL	NITZSCHIA PALEA	P	
1GOSUB	GOMPHONEMA SUBCLAVATUM	P	
1HANAM	HANTZSCHIA AMPHIOXYS	P	
1SYULN	SYNEDRA ULNA	P	
1GOANG	GOMPHONEMA ANGUSTATUM	P	

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - A


SAMPLE DATE - 092980

C - 117      V - 100 ML   DF - 1:19    L - 50 MM    W - .34  MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDE-NEW

LOG NUMBER - 147-132       ANALYST - RD

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                                                                         NUMBER COUNTED
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                                                                    DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                             PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1COCPL    COCCONEIS PLACENTULA                                       102
  2MICSP    MICROSPORA SP.                                                                P
  2CLASP    CLADOPHORA SP.                                                                P
  1RHCUR    RHOICOSPHENIA CURVATA                                      P
  2PALCH    PALMELLA STAGE OF CHAETOPHORACEAE                                             1
  1NIPAL    NITZSCHIA PALEA                                            7
  1ACLAD    ACHNANTHES LANCEOLATA VAR. DUBIA                           100
  1ACMIN    ACHNANTHES MINUTISSIMA                                     96
  1NIDIS    NITZSCHIA DISSIPATA                                        20
  1NIIGN    NITZSCHIA IGNORATA                                         5
  1NACRY    NAVICULA CRYPTOCEPHALA                                     7
  1COCPE    COCCONEIS PEDICULUS                                        25
  1FRAVA    FRAGILARIA VAUCHERIAE                                      1
  1NIFRU    NITZSCHIA FRUSTULUM                                        3
  1ACLAN    ACHNANTHES LANCEOLATA                                      4
  1NAVIA    NAVICULA VIRIDULA VAR. AVENACEA                            15
  1CYMMS    CYMBELLA MINUTA VAR. SILESIACA                             1
  1AMPER    AMPHORA PERPUSILLA                                         3
  1SUOVA    SURIRELLA OVATA                                            1
  1NANOT    NAVICULA NOTHA                                             1
  1NASEA    NAVICULA SECRETA VAR. APICULATA                            5
  1NACRV    NAVICULA CRYPTOCEPHALA VAR. VENETA                         1
  1NAMEU    NAVICULA MENISCULUS VAR. UPSALIENSIS                       1
  1SUANG    SURIRELLA ANGUSTATA                                        1
  1SYMIN    SYNEDRA MINUSCULA                                          1
  1NILIN    NITZSCHIA LINEARIS                                         1

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 092980

C - 210     V - 100 ML    DF - 1:19    L - 50 MM    W - .34  MM    D - 1  MM    S - 4    A - 3750 MM2
SUBSTRATE - GLASS SLIDE-NEW

LOG NUMBER - 148-132       ANALYST - RD

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                                                                              NUMBER COUNTED
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                                                                        DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                                PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1COCPE   COCCONEIS PEDICULUS                                          36
  1NAVIA   NAVICULA VIRIDULA VAR. AVENACEA                              3
  1COCPL   COCCONEIS PLACENTULA                                         72
  1ACLAD   ACHNANTHES LANCEOLATA VAR. DUBIA                             100
  1ACMIN   ACHNANTHES MINUTISSIMA                                       24
  1NIFRU   NITZSCHIA FRUSTULUM                                          4
  1EPSOR   EPITHEMIA SOREX                                              3
  1CYMAF   CYMBELLA AFFINIS                                             1
  1NILIN   NITZSCHIA LINEARIS                                           1
  1NACPY   NAVICULA CRYPTOCEPHALA                                       1
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                               1
  1NANOT   NAVICULA NOTHA                                               1
  1NIDIS   NITZSCHIA DISSIPATA                                          1
  1NISPP   NITZSCHIA SP.                                                1
  1CYMSI   CYMBELLA SINUATA                                             4
  1GOOLI   GOMPHONEMA OLIVACEUM                                         2
  1AMPER   AMPHORA PERPUSILLA                                           P
  1RHCUR   RHOICOSPHENIA CURVATA                                        P
  1FRAVA   FRAGILARIA VAUCHERIAE                                        P
  1NIAPI   NITZSCHIA APICULATA                                          P
  1SYFAS   SYNEDRA FASCICULATA                                          P
  1GOPAR   GOMPHONEMA PARVULUM                                          P
  1NAGRA   NAVICULA GRACILOIDES                                         P

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 092980

C - 181      V - 100 ML    DF - 1:19     L - 50 MM     W - .34  MM    D - 1  MM    S - 4     A - 3750 MM2
SUBSTRATE - GLASS SLIDE-NEW

LOG NUMBER - 149-132        ANALYST - RD

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                                                                            NUMBER COUNTED
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                                                                      DIATOMS              NON-DIATOMS
TAXON CODE    TAXON                                              PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1GYSPE    GYROSIGMA SPENCERII                                         P
  1NAVIA    NAVICULA VIRIDULA VAR. AVENACEA                             3
  1COCPE    COCCONEIS PEDICULUS                                         25
  1PIMAI    PINNULARIA MAIOR                                            P
  5EUSPP    EUGLENA SP.                                                                       P
  1NIHUN    NITZSCHIA HUNGARICA                                         P
  1SUOVL    SURIRELLA OVALIS                                            P
  1COCPL    COCCONEIS PLACENTULA                                        104
  1ACLAD    ACHNANTHES LANCEOLATA VAR. DUBIA                            80
  1SUOVA    SURIRELLA OVATA                                             3
  1ACMIN    ACHNANTHES MINUTISSIMA                                      37


  1NIPAL    NITZSCHIA PALEA                                             3
  1GOOLI    GOMPHONEMA OLIVACEUM                                        4
  1FRAVA    FRAGILARIA VAUCHERIAE                                       1
  1MERCI    MERIDION CIRCULARE                                          1
  1FRACV    FRAGILARIA CONSTRUENS VAR. VENETA                           1
  1NIFRU    NITZSCHIA FRUSTULUM                                         5
  1NILIN    NITZSCHIA LINEARIS                                          3
  1AMPER    AMPHORA PERPUSILLA                                          1
  1NASEA    NAVICULA SECRETA VAR. APICULATA                             1
  1NIDIS    NITZSCHIA DISSIPATA                                         8
  1CYMMS    CYMBELLA MINUTA VAR. SILESIACA                              1
  1NACRY    NAVICULA CRYPTOCEPHALA                                      1
  1NIIGN    NITZSCHIA IGNORATA                                          P
  1NATSC    NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES                    P
  1NIHUN    NITZSCHIA HUNGARICA                                         P
  1GOANG    GOMPHONEMA ANGUSTATUM                                       P
  1HANAM    HANTZSCHIA AMPHIOXYS                                        P
  1DEELE    DENTICULA ELEGANS                                           P
  1GYSPE    GYROSIGMA SPENCERII                                         P
  1SYFAS    SYNEDRA FASCICULATA                                         P
  1RHCUR    RHOICOSPHENIA CURVATA                                       P
  1CYMSI    CYMBELLA SINUATA                                            P

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OCTOBER

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PERIPHYTON BENCH SHEET
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CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

STATION I  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 102980

C - 1176    V - 100 ML    DF - 1119    L - 50 MM    W - .34  MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 159-132        ANALYST - RD

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                                                                          NUMBER COUNTED
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                                                                  DIATOMS                NON-DIATOMS
TAXON CODE   TAXON                                          PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1COCPE   COCCONEIS PEDICULUS                                     P
  1NAVIA   NAVICULA VIRIDULA VAR. AVENACEA                         34
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                            17
  2ULSPP   ULOTHRIX                                                                     P
  1SUOVA   SURIRELLA OVATA                                         P
  1NIACI   NITZSCHIA ACICULARIS                                    P
  1NISIE   NITZSCHIA SIGMOIDEA                                     P
  1NIHUN   NITZSCHIA HUNGARICA                                     P
  1RHCUR   RHOICOSPHENIA CURVATA                                   3
  1CYCME   CYCLOTELLA MENEGHINIANA                                 P
  1GOOLI   GOMPHONEMA OLIVACEUM                                    48
  1ACMIN   ACHNANTHES MINUTISSIMA                                  103
  1GOSUB   GOMPHONEMA SUBCLAVATUM                                  1
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                          15
  1NIDIS   NITZSCHIA DISSIPATA                                     22
  1NASEA   NAVICULA SECRETA VAR. APICULATA                         10
  1NACRY   NAVICULA CRYPTOCEPHALA                                  5
  1NIFRU   NITZSCHIA FRUSTULUM                                     6
  1GOPAR   GOMPHONEMA PARVULUM                                     3
  1NAHEU   NAVICULA HEUFLERI                                       1
  1NILIN   NITZSCHIA LINEARIS                                      P
  1CYMSI   CYMBELLA SINUATA                                        P
  1FRACA   FRAGILARIA CAPUCINA                                     P
  1COCPL   COCCONEIS PLACENTULA                                    P
  1NAELG   NAVICULA ELGINENSIS                                     P
  1DIVUL   DIATOMA VULGARE                                         P
  1ACLAN   ACHNANTHES LANCEOLATA                                   P
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STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 102980


C - 1421     V - 100 ML     DF - 1:19     L - 50 MM     W - .34  MM     D - 1  MM     S - 2     A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 160-132       ANALYST - RD

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                                                                       NUMBER COUNTED
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                                                                 DIATOMS            NON-DIATOMS
TAXON CODE   TAXON                                         PROPORTIONAL COUNT  SEDGWICK-RAFTER COUNT
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   2ULSPP  ULOTHRIX                                                              P
   1NAVIA  NAVICULA VIRIDULA VAR. AVENACEA                          24
   1COCPE  COCCONEIS PEDICULUS                                      1
   2PALCH  PALMELLA STAGE OF CHAETOPHORACEAE                                     58
   2GRCOC  UNIDENTIFIED GREEN COCCOID                                            P
   1NIHUN  NITZSCHIA HUNGARICA                                      P
   1SUOVL  SURIRELLA OVALIS                                         P
   1GOOLI  GOMPHONEMA OLIVACEUM                                     14
   1ACMIN  ACHNANTHES MINUTISSIMA                                   115
   1NIDIS  NITZSCHIA DISSIPATA                                      33
   1NIPAL  NITZSCHIA PALEA                                          5
   1NIFRU  NITZSCHIA FRUSTULUM                                      4
   1NICOM  NITZSCHIA COMMUNIS                                       P
   1GOPAR  GOMPHONEMA PARVULUM                                      1
   1NILIN  NITZSCHIA LINEARIS                                       P
   1AMPER  AMPHORA PERPUSILLA                                       5
   1SUOVA  SURIRELLA OVATA                                          2
   1NASEA  NAVICULA SECRETA VAR. APICULATA                          23
   1CYMMS  CYMBELLA MINUTA VAR. SILESIACA                           6
   1COCPL  COCCONEIS PLACENTULA                                     P
   1CYMAF  CYMBELLA AFFINIS                                         P
   1ACLAD  ACHNANTHES LANCEOLATA VAR. DUBIA                         4
   1NANOT  NAVICULA NOTHA                                           2
   1NACRY  NAVICULA CRYPTOCEPHALA                                   9
   1DIVUL  DIATOMA VULGARE                                          1
   1SYULD  SYNEDRA ULNA VAR. OXYRHYNCHUS                            1
   1NACRV  NAVICULA CRYPTOCEPHALA VAR. VENETA                       1
   1CYMMI  CYMBELLA MINUTA                                          2
   1NIIGN  NITZSCHIA IGNORATA                                       1
   1CYCME  CYCLOTELLA MENEGHINIANA                                  1
   1FRAVA  FRAGILARIA VAUCHERIAE                                    1
   1STASM  STAURONEIS SMITHII                                       P
   1CYMMC  CYMBELLA MICROCEPHALA                                    P
   1SYMIN  SYNEDRA MINUSCULA                                        P
   1RHCUR  RHOICOSPHENIA CURVATA                                    P
   1NIHOL  NITZSCHIA HOLSATICA                                      P
   1AMOVP  AMPHORA OVALIS                                           P
   1PISPP  PINNULARIA SP.                                           P
   1CYMSI  CYMBELLA SINUATA                                         P
   1SUANG  SURIRELLA ANGUSTATA                                      P
   1MERCI  MERIDION CIRCULARE                                       P

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STATION 1  - STEWART STATION
NUMBER OF REPLICATES - 3


REPLICATE - C
SAMPLE DATE - 102980

C - 1393    V - 100 ML    DF - 1:10    L - 50 MM    W - .34  MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NFL

LOG NUMBER - 151-132       ANALYST - RD

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                                                                              NUMBER COUNTED
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                                                                          DIATOMS           NON-DIATOMS
TAXON CODE   TAXON                                                 .  PROPORTIONAL COUNT  SEDGWICK-RAFTER COUNT
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  2PALCH    PALMELLA STAGE OF CHAETOPHORACEAE                                                    30
  1NAVIA    NAVICULA VIRIDULA VAR. AVENACEA                              21
  1NACRV    NAVICULA CRYPTOCEPHALA VAR. VENETA                           2
  2CLASP    CLADOPHORA SP.                                                                       4
  2ULSPP    ULOTHRIX                                                                             P
  6BASPP    BATRACHOSPERMUM SP.                                                                  P
  1SUOVA    SURIRELLA OVATA                                              P
  1NIACI    NITZSCHIA ACICULARIS                                         P
  1RHCUR    RHOICOSPHENIA CURVATA                                        P
  4DACRA    DACTYLOCOCCOPSIS RAPHIDIOIDES                                                        2
  1GOSUB    GOMPHONEMA SUBCLAVATUM                                       4
  1AMOVP    AMPHORA OVALIS                                               P
  1COCPL    COCCONEIS PLACENTULA                                         1
  1GOOLI    GOMPHONEMA OLIVACEUM                                         5
  1NILIN    NITZSCHIA LINEARIS                                           P
  1CYMMS    CYMBELLA MINUTA VAR. SILESIACA                               1
  1SUOVL    SURIRELLA OVALIS                                             P
  1NACRY    NAVICULA CRYPTOCEPHALA                                       5
  1ACMIN    ACHNANTHES MINUTISSIMA                                       110
  1GOPAR    GOMPHONEMA PARVULUM                                          2
  1ACLAD    ACHNANTHES LANCEOLATA VAR. DUBIA                             5
  1NASEA    NAVICULA SECRETA VAR. APICULATA                              12
  1NIPAL    NITZSCHIA PALEA                                              1
  1NIDIS    NITZSCHIA DISSIPATA                                          11
  1CYMAF    CYMBELLA AFFINIS                                             1
  1NIAPI    NITZSCHIA APICULATA                                          1
  1CYMMI    CYMBELLA MINUTA                                              3
  1CYMMC    CYMBELLA MICROCEPHALA                                        1
  1NATSC    NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES                     P
  1NIFRU    NITZSCHIA FRUSTULUM                                          1
  1NISPP    NITZSCHIA SP.                                                P
  1NAGRA    NAVICULA GRACILOIDES                                         P
  1CYCME    CYCLOTELLA MENEGHINIANA                                      P

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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 102980

C - 1380    V - 100 ML   DF - 1:10    L - 50 MM    W - .34  MM    D - 1  MM    S - 2    A - 3750 MM2


SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 162-132       ANALYST - RD

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                                                                   NUMBER COUNTED
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                                                               DIATOMS             NON-DIATOMS
TAXON CODE   TAXON                                       PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
------------------------------------------------------------------------------------------------

  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                          207
  2STITE   STIGEOCLONIUM TENUE                                                        P
  1NAVIA   NAVICULA VIRIDULA VAR. AVENACEA                        101
  1COCPE   COCCONEIS PEDICULUS                                    5
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                         11
  1SUOVA   SURIRELLA OVATA                                        1
  1SUOVL   SURIRELLA OVALIS                                       P
  1NISIE   NITZSCHIA SIGMOIDEA                                    P
  1NILIN   NITZSCHIA LINEARIS                                     7
  1PISPP   PINNULARIA SP.                                         P
  1RHCUR   RHOICOSPHENIA CURVATA                                  3
  1NIHUN   NITZSCHIA HUNGARICA                                    P
  1HANAM   HANTZSCHIA AMPHIOXYS                                   P
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                     17
  1NASEA   NAVICULA SECRETA VAR. APICULATA                        35
  1NALAN   NAVICULA LANCEOLATA                                    2
  1ACMIN   ACHNANTHES MINUTISSIMA                                 42
  1GOOLI   GOMPHONEMA OLIVACEUM                                   12
  1CYCME   CYCLOTELLA MENEGHINIANA                                1
  1NIFRU   NITZSCHIA FRUSTULUM                                    11
  1ACLAN   ACHNANTHES LANCEOLATA                                  7
  1NIDIS   NITZSCHIA DISSIPATA                                    7
  1GOPAR   GOMPHONEMA PARVULUM                                    11
  1SYULN   SYNEDRA ULNA                                           1
  1CYMMI   CYMBELLA MINUTA                                        1
  1SUANG   SURIRELLA ANGUSTATA                                    1
  1GOSUB   GOMPHONEMA SUBCLAVATUM                                 2
  1FRAVA   FRAGILARIA VAUCHERIAE                                  3
  1NIPAL   NITZSCHIA PALEA                                        P
  1FRACV   FRAGILARIA CONSTRUENS VAR. VENETA                      P
  1DIVUL   DIATOMA VULGARE                                        P
  1COCPL   COCCONEIS PLACENTULA                                   P
  1SYACU   SYNEDRA ACUS                                           P
  1RHGIB   RHOPALODIA GIBBERULA                                   P

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STATION 2  - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 102980

C - 1647    V - 100 ML    OF - 1119    L - 50 MM    W - .34  MM    D - 1  MM    S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 163-132       ANALYST - RD


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                                                                                   NUMBER COUNTED
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                                                                            DIATOMS              NON-DIATOMS
TAXON CODE   TAXON                                                     PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
------------------------------------------------------------------------------------------------------------

  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                      162
  1NAVIA   NAVICULA VIRIDULA VAR. AVENACEA                                  108
  1COCPE   COCCONEIS PEDICULUS                                              6
  1RHCUR   RHOICOSPHENIA CURVATA                                            5
  1SUOVA   SURIRELLA OVATA                                                  3
  1SUOVL   SURIRELLA OVALIS                                                 2
  1MELVA   MELOSIRA VARIANS                                                 P
  2STITE   STIGEOCLONIUM TENUE                                                                    7
  1CYMMS   CYMBELLA MINUTA VAR. SILESIACA                                   17
  1NIACI   NITZSCHIA ACICULARIS                                             P
  1HANAM   HANTZSCHIA AMPHIOXYS                                             P
  1GYACU   GYROSIGMA ACUMINATUM                                             1
  1NILIN   NITZSCHIA LINEARIS                                               3
  1CYCME   CYCLOTELLA MENEGHINIANA                                          8
  1NIDIS   NITZSCHIA DISSIPATA                                              16
  1ACMIN   ACHNANTHES MINUTISSIMA                                           55
  1DIVUL   DIATOMA VULGARE                                                  1
  1GOPAR   GOMPHONEMA PARVULUM                                              17
  1NASEA   NAVICULA SECRETA VAR. APICULATA                                  37
  1FRAVA   FRAGILARIA VAUCHERIAE                                            2
  1GOOLI   GOMPHONEMA OLIVACEUM                                             8
  1ACLAN   ACHNANTHES LANCEOLATA                                            10
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                               21
  1COCPL   COCCONEIS PLACENTULA                                             6
  1NIFRU   NITZSCHIA FRUSTULUM                                              25
  1SYMIN   SYNEDRA MINUSCULA                                                1
  1NACRY   NAVICULA CRYPTOCEPHALA                                           1
  1SYULN   SYNEDRA ULNA                                                     2
  1NIIGN   NITZSCHIA IGNORATA                                               2
  1NIPAL   NITZSCHIA PALEA                                                  2
  1FRALE   FRAGILARIA LEPTOSTAURON                                          1
  1AMPER   AMPHORA PERPUSILLA                                               2
  1FRURC   FRUSTULIA RHOMBOIDES VAR. CAPITATA                               P
  1FRACR   FRAGILARIA CROTONENSIS                                           P
  1AMOVP   AMPHORA OVALIS                                                   P
  1SUANG   SURIRELLA ANGUSTATA                                              P
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STATION 2 - MIDDLE STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 102980

C - 1057   V - 100 ML   DF - 1:19   L - 50 MM   W - .34 MM   D - 1 MM   S - 2   A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 164-132   ANALYST - RD

TAXON CODE	TAXON	NUMBER COUNTED DIATOMS PROPORTIONAL COUNT	NUMBER COUNTED NON-DIATOMS SEDGWICK-RAFTER COUNT
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		122
1NAVIA	NAVICULA VIRIDULA VAR. AVENACEA	100	
1COCPE	COCCONEIS PEDICULUS	3	
1CYMMS	CYMBELLA MINUTA VAR. SILESIACA	19	
1RHCUR	RHOICOSPHENIA CURVATA	5	
1NACRV	NAVICULA CRYPTOCEPHALA VAR. VENETA	11	
2STITE	STIGEOCLONIUM TENUE		P
1SUOVA	SURIRELLA OVATA	2	
1SUOVL	SURIRELLA OVALIS	1	
1NILIN	NITZSCHIA LINEARIS	1	
1GOOLI	GOMPHONEMA OLIVACEUM	5	
1GYSPE	GYROSIGMA SPENCERII	P	
1AMOVP	AMPHORA OVALIS	P	
2STAUP	STAURASTRUM SP.		P
1NIACI	NITZSCHIA ACICULARIS	P	
1NIAPI	NITZSCHIA APICULATA	1	
1CYCME	CYCLOTELLA MENEGHINIANA	3	
1GOSUB	GOMPHONEMA SUBCLAVATUM	2	
1ACMIN	ACHNANTHES MINUTISSIMA	53	
1NIFRU	NITZSCHIA FRUSTULUM	5	
1NASEA	NAVICULA SECRETA VAR. APICULATA	21	
1COCPL	COCCONEIS PLACENTULA	6	
1GOPAR	GOMPHONEMA PARVULUM	2	
1FRAVA	FRAGILARIA VAUCHERIAE	2	
1NANOT	NAVICULA NOTHA	2	
1NIDIS	NITZSCHIA DISSIPATA	3	
1NACRY	NAVICULA CRYPTOCEPHALA	5	
1SYULN	SYNEDRA ULNA	P	
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	P	
1RHGIB	RHOPALODIA GIBBERULA	P	

STATION 3 - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - A
SAMPLE DATE - 102980

C - 807 V - 100 ML DF - 1:19 L - 50 MM W - .34 MM D - 1 MM S - 2 A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 165-132 ANALYST - RD

TAXON CODE	TAXON	NUMBER COUNTED DIATOMS PROPORTIONAL COUNT	NUMBER COUNTED NON-DIATOMS SEDGWICK-RAFTER COUNT
1NAVIA	NAVICULA VIRIDULA VAR. AVENACEA	103	
1COCPE	COCCONEIS PEDICULUS	4	
1SUOVA	SURIRELLA OVATA	P	
1SUOVL	SURIRELLA OVALIS	1	
1SYFAS	SYNEDRA FASCICULATA	P	
1NILIN	NITZSCHIA LINEARIS	4	
1NACRV	NAVICULA CRYPTOCEPHALA VAR. VENETA	8	
1SUANG	SURIRELLA ANGUSTATA	P	
2PALCH	PALMELLA STAGE OF CHAETOPHORACEAE		15
1NASEA	NAVICULA SECRETA VAR. APICULATA	2	
1NIFRU	NITZSCHIA FRUSTULUM	6	
1GOPAR	GOMPHONEMA PARVULUM	2	
1ACLAD	ACHNANTHES LANCEOLATA VAR. DUBIA	4	
1ACAFF	ACHNANTHES AFFINIS	2	
1ACMIN	ACHNANTHES MINUTISSIMA	5	
1CYMSI	CYMBELLA SINUATA	1	
1ACLAN	ACHNANTHES LANCEOLATA	3	
1NIIGN	NITZSCHIA IGNORATA	1	
1NIDEN	NITZSCHIA DENTICULA	1	
1CYMMI	CYMBELLA MINUTA	1	
1HANAM	HANTZSCHIA AMPHIOXYS	1	
1GOOLI	GOMPHONEMA OLIVACEUM	P	
1GOSUB	GOMPHONEMA SUBCLAVATUM	P	
1CYCME	CYCLOTELLA MENEGHINIANA	P	

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - B
SAMPLE DATE - 102980

C - 763     V - 100 ML   DF - 1:19    L - 50 MM   W - .34  MM   D - 1  MM   S - 2    A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 166-132       ANALYST - RD

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                                                                             NUMBER COUNTED
                                                                             --------------

                                                                      DIATOMS            NON-DIATOMS
TAXON CODE   TAXON                                              PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1NAVIA   NAVICULA VIRIDULA VAR. AVENACEA                              108
  1COCPE   COCCONEIS PEDICULUS                                          8
  1GYSPE   GYROSIGMA SPENCERII                                          P
  1RHCUR   RHOICOSPHENIA CURVATA                                        P
  1NILIN   NITZSCHIA LINEARIS                                           3
  1SUOVA   SURIRELLA OVATA                                              P
  1SUOVL   SURIRELLA OVALIS                                             1
  1GOTRU   GOMPHONEMA TRUNCATUM                                         P
  2PALCH   PALMELLA STAGE OF CHAETOPHORACEAE                                                 91
  1ACLAN   ACHNANTHES LANCEOLATA                                        2
  1NACRY   NAVICULA CRYPTOCEPHALA                                       1
  1NIAPI   NITZSCHIA APICULATA                                          1
  1COCPL   COCCONEIS PLACENTULA                                         1
  1NACRV   NAVICULA CRYPTOCEPHALA VAR. VENETA                           1
  1NASEA   NAVICULA SECRETA VAR. APICULATA                              3


  1GOOLI   GOMPHONEMA OLIVACEUM                                         1
  1NAHEU   NAVICULA HEUFLERI                                            1
  1GOSUB   GOMPHONEMA SUBCLAVATUM                                       P
  1NIDEN   NITZSCHIA DENTICULA                                          P

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STATION 3  - HUNTER STATION
NUMBER OF REPLICATES - 3

REPLICATE - C
SAMPLE DATE - 102980

C - 640     V - 100 ML    DF - 1119    L - 50 MM    W - .34  MM    D - 1  MM    S - 2     A - 3750 MM2
SUBSTRATE - GLASS SLIDES-NEW

LOG NUMBER - 167-132       ANALYST - RG

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                                                                                NUMBER COUNTED
                                                                                --------------

                                                                         DIATOMS                NON-DIATOMS
TAXON CODE   TAXON                                               PROPORTIONAL COUNT   SEDGWICK-RAFTER COUNT
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  1NAVIA    NAVICULA VIRIDULA VAR. AVENACEA                              115
  1NISIE    NITZSCHIA SIGMOIDEA                                          P
  1COCPE    COCCONEIS PEDICULUS                                          4
  1NACRV    NAVICULA CRYPTOCEPHALA VAR. VENETA                           P
  1GYSPE    GYROSIGMA SPENCERII                                          P
  1SUOVA    SURIRELLA OVATA                                              P
  1CAAMP    CALONEIS AMPHISBAENA                                         P
  1SUOVL    SURIRELLA OVALIS                                             P
  1SYULN    SYNEDRA ULNA                                                 P
  1RHCUR    RHOICOSPHENIA CURVATA                                        P
  2PALCH    PALMELLA STAGE OF CHAETOPHORACEAE                                                  10
  1GOPAR    GOMPHONEMA PARVULUM                                          1
  1NILIN    NITZSCHIA LINEARIS                                           4
  1GOOLI    GOMPHONEMA OLIVACEUM                                         1
  1RHGIB    RHOPALODIA GIBBERULA                                         1
  1NIFRU    NITZSCHIA FRUSTULUM                                          1
  1COCPL    COCCONEIS PLACENTULA                                         4
  1ACMIN    ACHNANTHES MINUTISSIMA                                       20
  1CAVEN    CALONEIS VENTRICOSA                                          1
  1NASEA    NAVICULA SECRETA VAR. APICULATA                              1
  1NIAPI    NITZSCHIA APICULATA                                          1
  1NACRY    NAVICULA CRYPTOCEPHALA                                       P
  1ACLAN    ACHNANTHES LANCEOLATA                                        P
  1ACLAD    ACHNANTHES LANCEOLATA VAR. DUBIA                             P
  1SYULO    SYNEDRA ULNA VAR. OXYRHYNCHUS                                P

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19.13.03.UCLP, 7320,      0.620KLNS.
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PERIPHYTON SPECIES LIST

- Periphyton Taxa - All Stations
- Station 1 - Stewart Station (WP01)
- Station 2 - Middle Station (WP02)
- Station 3 - Hunter Station (WP03)

Periphyton Taxa - All Stations

PERIPHYTON SPECIES LIST

CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B
1980

TAXON	STATION NUMBER 1	2	3
BACILLARIOPHYTA			
ACHNANTHES AFFINIS	X	X	X
ACHNANTHES LANCEOLATA	X	X	X
ACHNANTHES LANCEOLATA VAR. DUBIA	X	X	X
ACHNANTHES LINEARIS		X	
ACHNANTHES MICROCEPHALA	X	X	X
ACHNANTHES MINUTISSIMA	X	X	X
AMPHORA OVALIS	X	X	
AMPHORA PERPUSILLA	X	X	X
AMPHORA VENETA	X	X	X
ASTERIONELLA FORMOSA	X	X	X
CALONEIS AMPHISBAENA	X	X	X
CALONEIS SMITHII		X	
CALONEIS VENTRICOSA		X	X
COCCONEIS PEDICULUS	X	X	X
COCCONEIS PLACENTULA	X	X	X
CYCLOTELLA MENEGHINIANA	X	X	X
CYCLOTELLA STELLIGERA	X		
CYMATOPLEURA ELLIPTICA		X	
CYMATOPLEURA SOLEA	X	X	
CYMBELLA AFFINIS	X	X	X
CYMBELLA MICROCEPHALA	X		
CYMBELLA MINUTA	X	X	X
CYMBELLA MINUTA VAR. SILESIACA	X	X	X
CYMBELLA SINUATA	X	X	X
CYMBELLA TUMIDA	X	X	X
DENTICULA ELEGANS	X	X	X
DIATOMA HIEMALE VAR. MESODON	X	X	
DIATOMA TENUE VAR. ELONGATUM	X	X	
DIATOMA VULGARE	X	X	X
EPITHEMIA SOREX	X		X
FRAGILARIA CAPUCINA	X	X	
FRAGILARIA CONSTRUENS VAR. VENETA		X	X
FRAGILARIA CROTONENSIS	X	X	
FRAGILARIA LEPTOSTAURON		X	
FRAGILARIA VAUCHERIAE	X	X	X
FRUSTULIA RHOMBOIDES VAR. CAPITATA		X	
GOMPHONEMA ACUMINATUM	X		X
GOMPHONEMA ANGUSTATUM	X	X	X
GOMPHONEMA INTRICATUM	X	X	
GOMPHONEMA OLIVACEUM	X	X	X
GOMPHONEMA PARVULUM	X	X	X
GOMPHONEMA SIMUS		X	
GOMPHONEMA SUBCLAVATUM	X	X	X
GOMPHONEMA SUBCLAVATUM VAR. UPSALIENSIS	X		
GOMPHONEMA TRUNCATUM		X	X
GYROSIGMA ACUMINATUM		X	
GYROSIGMA SPENCERII	X	X	X
HANTZSCHIA AMPHIOXYS	X	X	X
MASTOGLOIA GREVILLEI	X		

MELOSIRA VARIANS		X	
MERIDION CIRCULARE	X	X	X
NAVICULA ARVENSIS	X	X	X
NAVICULA AURICULATA	X		
NAVICULA CINCTA	X	X	X
NAVICULA CRYPTOCEPHALA	X	X	X
NAVICULA CRYPTOCEPHALA VAR. VENETA	X	X	X
NAVICULA CUSPIDATA	X	X	
NAVICULA ELGINENSIS	X		
NAVICULA EXIGUA		X	
NAVICULA GRACILOIDES	X		X
NAVICULA HALOPHILA	X	X	
NAVICULA HEUFLERI	X	X	X
NAVICULA LANCEOLATA	X	X	
NAVICULA MENISCULUS VAR. UPSALIENSIS	X	X	X
NAVICULA MINIMA	X	X	X
NAVICULA MUTICA	X		
NAVICULA MUTICA VAR. UNDULATA	X	X	
NAVICULA NOTHA	X	X	X
NAVICULA PELLICULOSA	X	X	X
NAVICULA PUPULA			X
NAVICULA PYGMAEA	X	X	
NAVICULA RHYNCHOCEPHALA	X	X	X
NAVICULA SALINARUM VAR. INTERMEDIA		X	X
NAVICULA SECRETA VAR. APICULATA	X	X	X
NAVICULA SIMPLEX	X		
NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES	X	X	X
NAVICULA VIRIDULA	X	X	X
NAVICULA VIRIDULA VAR. AVENACEA	X	X	X
NAVICULA SP.	X		
NEIDIUM SP.			X
NITZSCHIA ACICULARIS	X	X	X
NITZSCHIA APICULATA	X	X	X
NITZSCHIA COMMUNIS	X	X	X
NITZSCHIA DENTICULA	X		X
NITZSCHIA DISSIPATA	X	X	X
NITZSCHIA FONTICOLA	X	X	X
NITZSCHIA FRUSTULUM	X	X	X
NITZSCHIA HOLSATICA	X	X	X
NITZSCHIA HUNGARICA	X	X	X
NITZSCHIA IGNORATA	X	X	X
NITZSCHIA LATENS		X	
NITZSCHIA LINEARIS	X	X	X
NITZSCHIA PALEA	X	X	X
NITZSCHIA SIGMOIDEA	X	X	X
NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS	X	X	X
NITZSCHIA SP.	X		X
PINNULARIA BOREALIS	X	X	X
PINNULARIA BREBISSONII	X		
PINNULARIA MAIOR		X	X
PINNULARIA SP.	X	X	
PLEUROSIGMA DELICATISSIMA		X	
RHOICOSPHENIA CURVATA	X	X	X
RHOPALODIA GIBBA	X	X	
RHOPALODIA GIBBERULA	X	X	X
RHOPALODIA MUSCULUS	X		X
STAURONEIS SMITHII	X	X	
STEPHANODISCUS ASTREA	X	X	
SURIRELLA ANGUSTATA	X	X	X
SURIRELLA LINEARIS			X
SURIRELLA OVALIS	X	X	X
SURIRELLA OVATA	X	X	X
SYNEDRA ACUS	X	X	X
SYNEDRA FASCICULATA	X	X	X
SYNEDRA MINUSCULA	X	X	X
SYNEDRA PULCHELLA VAR. LANCEOLATA	X	X	

SYNEDRA ULNA	X	X	X
SYNEDRA ULNA VAR. OXYRHYNCHUS	X	X	X
CHLOROPHYTA			
BULBOCHAETA SP.	X	X	
CLADOPHORA GLOMERATA	X		X
CLADOPHORA SP.	X	X	X
CLOSTERIUM SP.	X	X	
COSMARIUM SP.		X	
DRAPARNALDIA SP.	X	X	X
UNIDENTIFIED GREEN COCCOID	X		
MICROSPORA SP.	X	X	X
MOUGEOTIA SP.		X	X
OEDOGONIUM SP.	X	X	
PALMELLA STAGE OF CHAETOPHORACEAE	X	X	X
PANDORINA SP.	X		X
PEDIASTRUM TETRA		X	
SCENEDESMUS QUADRICAUDA		X	
SPIROGYRA SP.		X	
STAURASTRUM SP.		X	
STIGEOCLONIUM TENUE	X	X	X
ULOTHRIX	X	X	
ULOTHRIX ZONATA	X	X	
CHRYSOPHYTA			
VAUCHERIA SP.		X	
CYANOPHYTA			
ANABAENA CIRCINALIS	X		
ANABAENA SP.	X	X	X
ANACYSTIS SP.		X	
OSCILLATORIA SP.	X	X	X
PHORMIDIUM SP.	X	X	X
DACTYLOCOCCOPSIS RAPHIDIOIDES	X		
MERISMOPEDIA SP.		X	
EUGLENOPHYTA			
EUGLENA ARCUS		X	
EUGLENA SP.	X		X
PHACUS SP.		X	
RHODOPHYTA			
BATRACHOSPERMUM SP.	X		

X = ORGANISM IDENTIFIED TO THIS TAXONOMIC LEVEL OBSERVED AT SAMPLING STATION

Station 1 - Stewart Station (WP01)

PERIPHYTON SPECIES LIST

CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

SPECIES OCCURRENCE BY SAMPLING DATE AT STATION 1
1980

TAXON	SAMPLING DATE JUNE	 AUG	 SEP1	 SEP2	 OCT
BACILLARIOPHYTA					
ACHNANTHES AFFINIS	X	X			
ACHNANTHES LANCEOLATA	X	X	X	X	X
ACHNANTHES LANCEOLATA VAR. DUBIA	X	X		X	X
ACHNANTHES MICROCEPHALA		X			
ACHNANTHES MINUTISSIMA	X	X	X	X	X
AMPHORA OVALIS		X			X
AMPHORA PERPUSILLA	X	X	X	X	X
AMPHORA VENETA	X	X			
ASTERIONELLA FORMOSA			X		
CALONEIS AMPHISBAENA	X	X	X		
COCCONEIS PEDICULUS	X	X		X	X
COCCONEIS PLACENTULA	X	X	X	X	X
CYCLOTELLA MENEGHINIANA	X	X		X	X
CYCLOTELLA STELLIGERA	X				
CYMATOPLEURA SOLEA	X				
CYMBELLA AFFINIS					X
CYMBELLA MICROCEPHALA					X
CYMBELLA MINUTA	X	X	X	X	X
CYMBELLA MINUTA VAR. SILESIACA	X	X	X	X	X
CYMBELLA SINUATA		X	X	X	X
CYMBELLA TUMIDA				X	
DENTICULA ELEGANS			X		
DIATOMA HIEMALE VAR. MESODON		X			
DIATOMA TENUE VAR. ELONGATUM		X			
DIATOMA VULGARE		X			X
EPITHEMIA SOREX			X	X	
FRAGILARIA CAPUCINA		X			X
FRAGILARIA CROTONENSIS	X				
FRAGILARIA VAUCHERIAE	X	X	X	X	X
GOMPHONEMA ACUMINATUM		X		X	
GOMPHONEMA ANGUSTATUM		X	X		
GOMPHONEMA INTRICATUM		X			
GOMPHONEMA OLIVACEUM	X	X	X	X	X
GOMPHONEMA PARVULUM	X			X	X
GOMPHONEMA SUBCLAVATUM			X	X	X
GOMPHONEMA SUBCLAVATUM VAR. UPSALIENSIS	X				
GYROSIGMA SPENCERII	X	X		X	
HANTZSCHIA AMPHIOXYS	X	X		X	
MASTOGLOIA GREVILLEI	X				
MERIDION CIRCULARE	X				X
NAVICULA ARVENSIS	X				
NAVICULA AURICULATA		X			
NAVICULA CINCTA		X			
NAVICULA CRYPTOCEPHALA	X	X		X	X
NAVICULA CRYPTOCEPHALA VAR. VENETA	X	X	X	X	X
NAVICULA CUSPIDATA	X	X			
NAVICULA ELGINENSIS					X
NAVICULA GRACILOIDES			X	X	X
NAVICULA HALOPHILA		X			
NAVICULA HEUFLERI	X	X	X	X	X
NAVICULA LANCEOLATA				X	
NAVICULA MENISCULUS VAR. UPSALIENSIS	X	X	X		
NAVICULA MINIMA	X				
NAVICULA MUTICA			X		
NAVICULA MUTICA VAR. UNDULATA	X				
NAVICULA NOTHA		X	X		X
NAVICULA PELLICULOSA	X	X			
NAVICULA PYGMAEA	X				
NAVICULA RHYNCHOCEPHALA		X	X	X	
NAVICULA SECRETA VAR. APICULATA	X	X	X	X	X
NAVICULA SIMPLEX	X				

NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES			X		X
NAVICULA VIRIDULA	X	X	X		
NAVICULA VIRIDULA VAR. AVENACEA				X	X
NAVICULA SP.	X	X			
NITZSCHIA ACICULARIS	X	X			X
NITZSCHIA APICULATA	X	X			X
NITZSCHIA COMMUNIS		X			X
NITZSCHIA DENTICULA	X				
NITZSCHIA DISSIPATA	X	X	X	X	X
NITZSCHIA FONTICOLA	X				
NITZSCHIA FRUSTULUM		X	X	X	X
NITZSCHIA HOLSATICA	X	X			X
NITZSCHIA HUNGARICA	X	X	X		X
NITZSCHIA IGNORATA					X
NITZSCHIA LINEARIS	X	X	X	X	X
NITZSCHIA PALEA	X	X	X	X	X
NITZSCHIA SIGMOIDEA		X			X
NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS	X	X			
NITZSCHIA SP.				X	X
PINNULARIA BOREALIS		X			
PINNULARIA BREBISSONII		X			
PINNULARIA SP.	X				X
RHOICOSPHENIA CURVATA	X	X	X	X	X
RHOPALODIA GIBBA	X	X			
RHOPALODIA GIBBERULA			X		
RHOPALODIA MUSCULUS		X			
STAURONEIS SMITHII					X
STEPHANODISCUS ASTREA		X			
SURIRELLA ANGUSTATA	X	X			X
SURIRELLA OVALIS	X	X			X
SURIRELLA OVATA	X	X	X	X	X
SYNEDRA ACUS	X	X			
SYNEDRA FASCICULATA	X	X		X	
SYNEDRA MINUSCULA	X	X	X	X	X
SYNEDRA PULCHELLA VAR. LANCEOLATA	X				
SYNEDRA ULNA	X	X		X	
SYNEDRA ULNA VAR. OXYRHYNCHUS					X
CHLOROPHYTA					
BULBOCHAETA SP.				X	
CLADOPHORA GLOMERATA		X			
CLADOPHORA SP.			X		X
CLOSTERIUM SP.	X	X			
DRAPARNALDIA SP.		X			
UNIDENTIFIED GREEN COCCOID					X
MICROSPORA SP.	X				
OEDOGONIUM SP.		X			
PALMELLA STAGE OF CHAETOPHORACEAE	X	X	X	X	X
PANDORINA SP.		X			
STIGEOCLONIUM TENUE		X			
ULOTHRIX					X
ULOTHRIX ZONATA	X				
CHRYSOPHYTA					
CYANOPHYTA					
ANABAENA CIRCINALIS		X			
ANABAENA SP.	X	X	X		
OSCILLATORIA SP.	X	X	X		
PHORMIDIUM SP.	X				
DACTYLOCOCCOPSIS RAPHIDIOIDES					X
EUGLENOPHYTA					
EUGLENA SP.		X			
RHODOPHYTA					
BATRACHOSPERMUM SP.					X

X = ORGANISM IDENTIFIED TO THIS TAXONOMIC LEVEL OBSERVED AT SAMPLING STATION

Station 2 - Middle Station (WP02)

PERIPHYTON SPECIES LIST

CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

SPECIES OCCURRENCE BY SAMPLING DATE AT STATION 2
1980

TAXON	SAMPLING DATE JUNE	 AUG	 SEP1	 SEP2	 OCT
BACILLARIOPHYTA					
ACHNANTHES AFFINIS		X	X		
ACHNANTHES LANCEOLATA	X	X	X	X	X
ACHNANTHES LANCEOLATA VAR. DUBIA	X	X	X	X	X
ACHNANTHES LINEARIS		X			
ACHNANTHES MICROCEPHALA		X	X		
ACHNANTHES MINUTISSIMA	X	X	X	X	X
AMPHORA OVALIS	X				X
AMPHORA PERPUSILLA	X	X	X	X	X
AMPHORA VENETA			X		
ASTERIONELLA FORMOSA			X		
CALONEIS AMPHISBAENA	X	X			
CALONEIS SMITHII	X				
CALONEIS VENTRICOSA	X	X			
COCCONEIS PEDICULUS	X	X	X	X	X
COCCONEIS PLACENTULA		X	X	X	X
CYCLOTELLA MENEGHINIANA	X	X	X	X	X
CYMATOPLEURA ELLIPTICA				X	
CYMATOPLEURA SOLEA	X				
CYMBELLA AFFINIS				X	
CYMBELLA MINUTA	X	X	X	X	X
CYMBELLA MINUTA VAR. SILESIACA	X	X	X	X	X
CYMBELLA SINUATA		X	X	X	
CYMBELLA TUMIDA	X	X	X		
DENTICULA ELEGANS		X			
DIATOMA HIEMALE VAR. MESODON		X			
DIATOMA TENUE VAR. ELONGATUM		X			
DIATOMA VULGARE		X		X	X
FRAGILARIA CAPUCINA		X	X		
FRAGILARIA CONSTRUENS VAR. VENETA		X			X
FRAGILARIA CROTONENSIS	X			X	X
FRAGILARIA LEPTOSTAURON	X				X
FRAGILARIA VAUCHERIAE	X	X		X	X
FRUSTULIA RHOMBOIDES VAR. CAPITATA					X
GOMPHONEMA ANGUSTATUM	X	X	X	X	
GOMPHONEMA INTRICATUM		X			
GOMPHONEMA OLIVACEUM	X	X	X	X	X
GOMPHONEMA PARVULUM	X			X	X
GOMPHONEMA SIMUS		X			
GOMPHONEMA SUBCLAVATUM		X	X	X	X
GOMPHONEMA TRUNCATUM	X				
GYROSIGMA ACUMINATUM					X
GYROSIGMA SPENCERII	X	X	X		X
HANTZSCHIA AMPHIOXYS	X	X		X	X
MELOSIRA VARIANS					X
MERIDION CIRCULARE		X			
NAVICULA ARVENSIS		X	X	X	
NAVICULA CINCTA	X	X			

NAVICULA CRYPTOCEPHALA	X	X		X	X
NAVICULA CRYPTOCEPHALA VAR. VENETA	X	X		X	X
NAVICULA CUSPIDATA	X	X			
NAVICULA EXIGUA		X			
NAVICULA HALOPHILA	X	X			
NAVICULA HEUFLERI	X	X			
NAVICULA LANCEOLATA					X
NAVICULA MENISCULUS VAR. UPSALIENSIS		X			
NAVICULA MINIMA	X	X			
NAVICULA MUTICA VAR. UNDULATA	X				
NAVICULA NOTHA		X	X		X
NAVICULA PELLICULOSA	X	X			
NAVICULA PYGMAEA	X				
NAVICULA RHYNCHOCEPHALA		X	X	X	
NAVICULA SALINARUM VAR. INTERMEDIA	X				
NAVICULA SECRETA VAR. APICULATA	X	X	X	X	X
NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES	X		X		
NAVICULA VIRIDULA	X	X	X		
NAVICULA VIRIDULA VAR. AVENACEA				X	X
NITZSCHIA ACICULARIS	X	X		X	X
NITZSCHIA APICULATA	X			X	X
NITZSCHIA COMMUNIS		X			
NITZSCHIA DISSIPATA	X	X	X	X	X
NITZSCHIA FONTICOLA	X				
NITZSCHIA FRUSTULUM	X	X	X	X	X
NITZSCHIA HOLSATICA	X	X	X		
NITZSCHIA HUNGARICA	X	X	X	X	X
NITZSCHIA IGNORATA					X
NITZSCHIA LATENS		X			
NITZSCHIA LINEARIS	X	X	X	X	X
NITZSCHIA PALEA	X	X	X	X	X
NITZSCHIA SIGMOIDEA	X	X			X
NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS	X	X		X	
PINNULARIA BOREALIS	X	X			
PINNULARIA MAIOR	X				
PINNULARIA SP.		X			X
PLEUROSIGMA DELICATISSIMA		X			
RHOICOSPHENIA CURVATA		X	X	X	X
RHOPALODIA GIBBA			X		
RHOPALODIA GIBBERULA		X			X
STAURONEIS SMITHII	X				
STEPHANODISCUS ASTREA		X			
SURIRELLA ANGUSTATA	X	X	X	X	X
SURIRELLA OVALIS	X	X		X	X
SURIRELLA OVATA	X	X	X	X	X
SYNEDRA ACUS	X	X			X
SYNEDRA FASCICULATA	X	X			
SYNEDRA MINUSCULA	X	X	X	X	X
SYNEDRA PULCHELLA VAR. LANCEOLATA		X			
SYNEDRA ULNA	X	X	X	X	X
SYNEDRA ULNA VAR. OXYRHYNCHUS		X			
CHLOROPHYTA					
BULBOCHAETA SP.	X				
CLADOPHORA SP.				X	
CLOSTERIUM SP.		X			
COSMARIUM SP.		X			
DRAPARNALDIA SP.		X			
MICROSPORA SP.		X			
MOUGEOTIA SP.	X	X			
OEDOGONIUM SP.		X			
PALMELLA STAGE OF CHAETOPHORACEAE	X	X	X	X	X
PEDIASTRUM TETRA		X			
SCENEDESMUS QUADRICAUDA		X			
SPIROGYRA SP.			X		
STAURASTRUM SP.					X

STIGEOCLONIUM TENUE			X	X	X
ULOTHRIX		X			
ULOTHRIX ZONATA	X	X			
CHRYSOPHYTA					
VAUCHERIA SP.				X	
CYANOPHYTA					
ANABAENA SP.	X	X	X		
ANACYSTIS SP.				X	
OSCILLATORIA SP.	X			X	
PHORMIDIUM SP.	X		X		
MERISMOPEDIA SP.			X	X	
EUGLENOPHYTA					
EUGLENA ARCUS				X	
PHACUS SP.		X			
RHODOPHYTA					

X = ORGANISM IDENTIFIED TO THIS TAXONOMIC LEVEL OBSERVED AT SAMPLING STATION

Station 3 - Hunter Station (WP03)

PERIPHYTON SPECIES LIST

CATHEDRAL BLUFFS SHALE OIL COMPANY
TRACT C-B

SPECIES OCCURRENCE BY SAMPLING DATE AT STATION 3
1980

TAXON	SAMPLING DATE JUNE	AUG	SEP1	SEP2	OCT
BACILLARIOPHYTA					
ACHNANTHES AFFINIS		X	X		X
ACHNANTHES LANCEOLATA		X	X	X	X
ACHNANTHES LANCEOLATA VAR. DUBIA	X	X	X	X	X
ACHNANTHES MICROCEPHALA			X		
ACHNANTHES MINUTISSIMA	X	X	X	X	X
AMPHORA PERPUSILLA	X	X	X	X	
AMPHORA VENETA			X		
ASTERIONELLA FORMOSA			X		
CALONEIS AMPHISBAENA		X			X
CALONEIS VENTRICOSA					X
COCCONEIS PEDICULUS	X	X	X	X	X
COCCONEIS PLACENTULA		X	X	X	X
CYCLOTELLA MENEGHINIANA	X	X	X		X
CYMBELLA AFFINIS				X	
CYMBELLA MINUTA		X	X		X
CYMBELLA MINUTA VAR. SILESIACA		X	X	X	
CYMBELLA SINUATA		X	X	X	X
CYMBELLA TUMIDA			X		
DENTICULA ELEGANS		X	X	X	
DIATOMA VULGARE		X	X		
EPITHEMIA SOREX				X	
FRAGILARIA CONSTRUENS VAR. VENETA				X	
FRAGILARIA VAUCHERIAE	X	X	X	X	
GOMPHONEMA ACUMINATUM			X		
GOMPHONEMA ANGUSTATUM	X	X	X	X	
GOMPHONEMA OLIVACEUM	X	X	X	X	X
GOMPHONEMA PARVULUM		X		X	X
GOMPHONEMA SUBCLAVATUM			X		X
GOMPHONEMA TRUNCATUM					X
GYROSIGMA SPENCERII		X		X	X

HANTZSCHIA AMPHIOXYS		X		X	X
MERIDION CIRCULARE				X	
NAVICULA ARVENSIS	X	X			
NAVICULA CINCTA	X				
NAVICULA CRYPTOCEPHALA	X	X		X	X
NAVICULA CRYPTOCEPHALA VAR. VENETA	X	X	X	X	X
NAVICULA GRACILOIDES				X	
NAVICULA HEUFLERI	X	X	X		X
NAVICULA MENISCULUS VAR. UPSALIENSIS		X	X	X	
NAVICULA MINIMA	X				
NAVICULA NOTHA		X		X	
NAVICULA PELLICULOSA		X	X		
NAVICULA PUPULA		X			
NAVICULA RHYNCHOCEPHALA		X	X		
NAVICULA SALINARUM VAR. INTERMEDIA	X				
NAVICULA SECRETA VAR. APICULATA	X	X	X	X	X
NAVICULA TRIPUNCTATA VAR. SCHIZONEMOIDES	X	X	X	X	
NAVICULA VIRIDULA	X	X	X		
NAVICULA VIRIDULA VAR. AVENACEA				X	X
NEIDIUM SP.		X			
NITZSCHIA ACICULARIS	X	X			
NITZSCHIA APICULATA				X	X
NITZSCHIA COMMUNIS		X			
NITZSCHIA DENTICULA			X		X
NITZSCHIA DISSIPATA	X	X	X	X	
NITZSCHIA FONTICOLA	X				
NITZSCHIA FRUSTULUM		X	X	X	X
NITZSCHIA HOLSATICA	X	X	X		
NITZSCHIA HUNGARICA	X	X	X	X	
NITZSCHIA IGNORATA				X	X
NITZSCHIA LINEARIS	X	X	X	X	X
NITZSCHIA PALEA	X	X	X	X	
NITZSCHIA SIGMOIDEA		X	X		X
NITZSCHIA TRYBLIONELLA VAR. LEVIDENSIS		X	X		
NITZSCHIA SP.				X	
PINNULARIA BOREALIS		X			
PINNULARIA MAIOR				X	
RHOICOSPHENIA CURVATA		X	X	X	X
RHOPALODIA GIBBERULA		X			X
RHOPALODIA MUSCULUS		X			
SURIRELLA ANGUSTATA	X	X		X	X
SURIRELLA LINEARIS			X		

SURIRELLA OVALIS	X	X	X	X	X
SURIRELLA OVATA	X	X	X	X	X
SYNEDRA ACUS	X				
SYNEDRA FASCICULATA				X	X
SYNEDRA MINUSCULA	X	X		X	
SYNEDRA ULNA		X	X		X
SYNEDRA ULNA VAR. OXYRHYNCHUS					X
CHLOROPHYTA					
CLADOPHORA GLOMERATA		X	X		
CLADOPHORA SP.				X	
DRAPARNALDIA SP.		X			
MICROSPORA SP.				X	
MOUGEOTIA SP.		X			
PALMELLA STAGE OF CHAETOPHORACEAE	X	X	X	X	X
PANDORINA SP.			X		
STIGEOCLONIUM TENUE		X			
CHRYSOPHYTA					
CYANOPHYTA					
ANABAENA SP.	X				
OSCILLATORIA SP.	X	X	X		
PHORMIDIUM SP.			X		
EUGLENOPHYTA					
EUGLENA SP.				X	
RHODOPHYTA					

X = ORGANISM IDENTIFIED TO THIS TAXONOMIC LEVEL OBSERVED AT SAMPLING STATION

2.5.3 Terrestrial Vegetation Studies

Vegetation data collection was conducted in Summer 1980; the results of data analyzed will appear in C-b Annual Analysis Report, April 1981.

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2.5.4 THREATENED & ENDANGERED SPECIES

No additional studies were conducted during this reporting period.

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2.5.5 Revegetation

Revegetation studies were conducted at the C-b Tract during 1980; results of the studies will appear in C-b Annual Analysis Report, April 1981.

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2.5.6 SOIL SURVEY AND PRODUCTIVITY ASSESSMENT

No additional studies were conducted during this report period.

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2.5.7 DENDROCHRONOLOGY & DENDROCLIMATOLOGY STUDIES

No additional studies were conducted during this report period.

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2.6 ARCHAEOLOGICAL STUDIES

No additional studies were conducted during this report period.

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2.7 Industrial Health and Safety

Periodic reports on Health and Safety Activities have been requested by the Deputy Conservation Manager. Accident Frequency and Mine Gas Monitoring summaries for this reporting period (June - November 1980) are presented in this section.

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2.7.1 Accident Frequency

Data presented in this section as provided by the Health and Safety Department. Table 2.7.1-1* presents the basic man hours, accident and injury rate data for the period from January, 1980 through November, 1980. MSHA inspection reports and citations are on file and are available upon request.

* IR = Injury rate
RA= Reported accidents
LTA= Lost time accidents

TABLE 2.7.1-1

MANHOURS AND ACCIDENT DATA FOR TRACT C-b

1980	OCCIDENTAL										CONTRACTOR										OXY & CONTR.									
	MAN HOURS			ACCIDENTS				I.R.			MAN HOURS			ACCIDENTS				I.R.			MAN HOURS			ACCIDENTS				I.R.	
	MONTH	Y.T.D	QRTR.	mon RA	ytd RA	mon LTA	ytd LTA	mon IR	ytd IR	MONTH	Y.T.D.	QRTR.	mon RA	ytd RA	mon LTA	ytd LTA	mon IR	ytd IR	MONTH	Y.T.D.	QRTR.	mon RA	ytd RA	mon LTA	ytd LTA	mon IR	ytd IR
JAN.	6,349	6,349		1	1	1	1	31.5		50,583			1	1	1	1	3.95		56,932			2	2	2	2	7.03	
FEB.	10,720	17,069		0	1	0	1	0	11.71	45,865	96,336		1	2	0	1	4.36	4.15	56,585	113,405		1	3	0	2	3.53	5.29
MAR	10,020.5	27,089.5	27,089.5	0	1	0	1	0	7.39	47,102	143,438	143,438	2	4	2	3	8.49	5.58	57,122.5	170,527.5	170,527.5	2	5	2	4	7.00	5.86
APR	12,002	39,091.5		0	1	0	1	0	5.12																		
MAY	14,924.5	54,016		0	1	0	1	0	3.70																		
JUN	15,313.5	69,329.5	69329.5	1	2	0	1	13.06	5.77																		
JUL	17,725.5	87055		1	3	1	2	11.28	6.89	53,665			2	9	1	6	7.45	5.27	71,390			3	12	2	8	8.40	5.60
AUG	20,942	107,997		0	3	0	2	0	5.6	47,914			1	10	1	7	4.17	5.14	68,856			1	13	1	9	2.90	5.23
SEP	18,219.5	126216.5	126216.5	0	3	0	2	0	4.75	48,615.5			1	11	0	7	4.11	5.02	66,835			1	14	0	7	2.99	1.90
OCT	19480.5	145697		0	3	0	2	0	4.12																		
NOV	19364	165061		0	5	0	2	0	2.42																		
DEC																											

2.7.2 Mine Gas Monitoring

Mine gas samples are required at least once every 24 hours from the exhaust air of each shaft. Table 2.7.2-1 presents ventilation/escape shaft summarized data of methane gas analysis.

TABLE 2.7.2-1

VENTILATION AND ESCAPE SHAFT GAS ANALYSIS WEEKLY SUMMARY

MEMO Date	Methane Reading - %
5/31/80	-0-
6/7/80	.017
7/3/80	-0-
7/8/80	-0-
7/11/80	-0-
7/15/80	-0-
7/22/80	.017
7/28/80	.029
7/29/80	.008
8/8/80	.032
8/19/80	.042
8/29/80	.043
9/2/80	.036
9/8/80	.053
9/17/80	.033
9/26/80	.094
10/3/80	-0-
10/7/80	.040
10/8/80	.125
10/9/80	.053
10/10/80	.114
10/11/80	.090
10/15/80	.110
10/16/80	.084
10/17/80	.085
10/31/80	.050
11/3/80	.05
11/6/80	.072
11/10/80	.06

3.0 Other Studies

Data were collected in two of the programs within the Other Studies categories for June, 1980 through November, 1980. These programs were: Micro-environmental Studies and Traffic Load Studies. The other programs in the Other Studies categories were inactive during this report period.

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3.1 Fish & Wildlife Management Plan

No additional studies were made during this report period.

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3.2 MICRO-CLIMATE PROGRAM

Introduction

Micro-climatic parameters for June, 1980 - November, 1980 include the following: Maximum and minimum temperature at surface and at one meter and precipitation totals. (Table 3.2-1)

Scope

Studies of micro-climatic parameters on the C-b Tract provide data that are useful in assessing changes in vegetation production and structure, animal populations, or animal activity patterns, and may also be correlated with changes in functional components of the C-b ecosystem that may occur as a result of shale oil development. Five micro-climatic stations are located in developmental sites and five in control sites:

The following sites are monitored:

MC Station Locations

BC01	Chained Pinyon-Juniper Rangeland, Veg. Plot 1
BC02	Chained Pinyon-Juniper Rangeland, Veg. Plot 2
BC03	Plateau Sagebruch, Veg. Plot 3
BC04	Valley Bottom Sagebrush, Veg. Plot 4
BC05	Pinyon-Juniper Woodland, Veg. Plot 5
BC06	Pinyon-Juniper Woodland, Veg. Plot 6
BC07	Chained Pinyon-Juniper Rangeland (Animal Trapping Transect)
BC08	Bunchgrass Community, South-facing Slope
BC09	Valley Bottom Sagebrush, Mouth of Sorghum Gulch
BC13	Mixed Mountain Shrubland, North-facing Slope

All temperature readings consist only of maximum and minimum readings for two-week periods. Precipitation is measured only during the growing season, March through October. Therefore, precipitation data from meteorology stations AB20 and AB23 are utilized for winter-month readings (November-February) for valley and pinyon-juniper microclimate stations. Snow measurements are obtained approximately from November-February, but no snow measurements are available for this report period.

MICROCLIMATE DATA

TEMPERATURE MAXIMA AND MINIMA AND PRECIPITATION TOTALS *

June 1980 - November 1980

STATION	MONTH	MAXIMA AIR TEMP	MAXIMA SURFACE TEMP	MINIMA AIR TEMP	MINIMA SURFACE TEMP	PRECIPITATION
BC01	6	35.0	39.0	-17.0	-1.0	.00
	7	36.0	47.0	-10.0	-5.0	1.78
	8	31.0	41.0	2.0	-2.0	.70
	9	28.0	38.0	2.0	-4.0	.40
	10	26.0	30.0	-9.0	-14.0	1.49
	11	18.0	22.0	-7.0	-7.0	.46
BC02	6	33.0	39.0	-4.0	-4.0	.00
	7	33.0	41.0	-7.0	-4.0	1.63
	8	32.0	42.0	5.0	-3.0	.66
	9	31.0	40.0	-4.0	-7.0	.53
	10	25.0	36.0	-12.0	-15.0	1.21
	11	18.0	23.0	-7.0	-10.0	.56
BC03	6	31.0	35.0	.0	-4.0	.00
	7	27.0	37.0	-9.0	-13.0	1.84
	8	28.0	33.0	1.0	.0	.84
	9	35.0	40.0	3.0	-5.0	.46
	10	16.0	22.0	-11.0	945.0	1.44
	11	15.0	24.0	-8.0	-4.0	.56
BC04	6	36.0	36.0	-6.0	-5.0	.00
	7	38.0	29.0	.0	.0	1.62
	8	35.0	34.0	-3.0	-3.0	.60
	9	37.0	37.0	2.0	4.0	.65
	10	18.0	21.0	-14.0	-13.0	1.32
	11	22.0	24.0	-8.0	-6.0	.54
BC05	6	32.0	41.0	-16.0	-17.0	.00
	7	35.0	39.0	-4.0	-9.0	.83
	8	33.0	39.0	-1.0	2.0	.58
	9	37.0	38.0	-2.0	2.5	.31
	10	23.0	26.0	-14.0	-11.0	1.07
	11	17.0	21.0	-9.0	-5.0	.31
BC06	6	33.0	41.0	-4.0	.0	.00
	7	43.0	50.0	-12.0	-11.0	1.49
	8	37.0	40.0	-2.0	2.0	.94
	9	31.0	38.0	-2.0	-3.0	.38
	10	24.0	31.0	-16.0	-11.0	1.30
	11	18.0	22.0	-10.0	-6.0	.50
BC07	6	34.0	36.0	-2.0	-3.0	.00
	7	38.0	37.0	-5.0	-4.0	1.76
	8	33.0	40.0	1.0	-3.0	24
	9	31.0	36.0	-1.0	-3.0	.46
	10	26.0	30.0	-14.0	-16.0	1.15
	11	16.0	24.0	-8.0	-8.0	.44
BC08	6	27.0	37.0	-25.0	-15.0	.00
	7	35.0	40.0	-10.0	-7.0	1.51
	8	36.0	39.0	11.0	.0	.65
	9	39.0	33.0	-3.0	.0	.45
	10	32.0	30.0	-11.0	-7.0	1.22
	11	24.0	22.0	-6.0	-2.0	.38
BC09	6	34.0	40.0	-8.0	-5.0	.00
	7	34.0	44.0	-4.0	-2.0	.91
	8	36.0	42.0	-4.0	-3.0	.61
	9	31.0	38.0	-12.0	-8.0	.25
	10	26.0	33.0	-17.0	-13.0	1.16
	11	20.0	18.0	-12.0	-10.0	98.50 **
BC13	6	33.0	42.0	-2.0	-2.0	.00
	7	34.0	40.0	-10.0	-7.0	1.72
	8	28.0	42.0	4.0	4.0	.82
	9	32.0	35.0	.0	1.0	.46
	10	22.0	31.0	-14.0	-12.0	1.42
	11	20.0	21.0	-7.0	-6.0	.48

(*) TEMPERATURE (°C)
PRECIPITATION (CM)

(**) MISSING DATA CODE

3.3 SCENIC VALUES STUDY

No additional studies were conducted during this report period.

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3.4 Traffic Load

This section contains data relating to vehicular and passenger load along Piceance Creek road and into the C-b Oil Shale Tract.

Daily vehicle counts taken at the C-b Guard Shack are presented in Table 3.4-1. These data were broken down into counts of cars and trucks beginning in January 1980.

The C-b Shale Oil Project began providing regular bus service for employees to and from the C-b Tract on April 1, 1978. Table 3.4-2, summarizes bus passenger miles data for 1980. Contractor work force data by shift has been provided starting September 21, 1979 and is on file in Grand Junction.

A program of monitoring vehicular traffic was initiated in March, 1978. Counters were placed at the Rio Blanco Store (BT01), Cattleguard (BT02), and Rio Blanco Lake (BT03). Table 3.4-3 presents a summary of the traffic data collected at these three stations for this report period, also included is the raw data for the same stations.

TABLE 3.4-1

GUARD SHACK TRAFFIC COUNT

Day Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
January	Car	2	12	30	37	21	16	6	70	70	21	31	17	14	36	75	61	74	47	5	11	48	76	53	38	7	10	26	21	35	39	50
	Truck	0	7	8	4	3	0	3	18	10	3	6	5	0	5	10	13	15	13	0	0	0	8	16	11	11	9	4	7	11	0	18
February	Car	42	24	10	35	93	53	45	37	10	19	38	76	51	9	50	13	20	21	62	85	52	41	13	9	89	40	14	29	28		
	Truck	6	17	5	14	16	8	8	8	0	1	13	6	12	4	6	1	0	3	3	11	9	13	2	0	13	20	10	14	8		
March	Car	19	30	89	37	34	13	66	20	7	33	83	87	73	87	30	9	69	61	65	24	68	12	9	58	23	28	40	93	12	28	12
	Truck	0	5	11	21	10	6	6	5	0	19	10	12	12	17	10	5	24	17	17	13	18	4	0	12	6	10	10	14	1	0	7
April	Car	47	59	39	28	32	18	14	51	34	74	67	41	1	26	17	59	55	34	5	19	43	62	63	77	51	50	35	58	75	68	
	Truck	12	8	3	8	6	2	8	10	12	7	16	0	0	9	6	12	7	3	0	1	6	5	6	13	9	0	0	5	8	5	
May	Car	43	84	17	25	34	62	45	72	71	26	30	47	45	77	56	26	32	7	60	113	89	53	94	15	28	12	91	80	91	110	15
	Truck	6	2	0	0	9	4	7	5	4	0	0	3	7	2	4	3	0	1	13	18	17	4	10	4	0	0	5	1	11	1	0
June	Car	52	59	95	71	63	41	51	26	88	92	44	62	86	28	29	72	115	67	72	81	31	34	95	98	88	96	78	3	34	86	
	Truck	0	7	2	3	5	7	2	0	4	6	4	15	17	0	0	13	15	12	11	6	1	0	8	10	19	12	11	1	0	7	
July	Car	110	82	59	15	33	39	73	96	76	85	116	40	43	56	79	98	73	105	42	41	81	73	35	82	76	42	37	42	107	105	121
	Truck	11	8	8	0	3	1	8	9	6	2	3	0	0	7	7	7	7	12	2	0	7	8	14	12	19	6	1	8	6	9	20
August	Car	72	41	48	33	90	76	94	99	51	36	91	130	132	102	150	47	42	113	140	84	51	113	32	39	74	60	114	88	83	45	41
	Truck	17	3	0	12	3	5	3	4	1	0	5	13	6	7	14	0	0	21	16	13	9	8	1	1	17	11	4	7	7	6	0
September	Car	22	193	87	85	100	36	29	78	123	116	119	96	55	38	36	124	142	94	107	100	50	108	118	89	83	122	63	41	73	106	
	Truck	4	11	9	7	7	0	0	4	9	5	4	6	0	0	2	12	18	14	17	10	0	9	1	6	4	35	0	0	54	34	
October	Car	103	100	105	62	20	75	86	100	104	102	43	31	71	107	93	105	81	51	46	104	143	96	101	95	41	34	80	132	118	165	125
	Truck	18	7	16	2	0	42	44	39	51	29	0	0	45	47	32	38	35	6	0	36	14	12	17	23	0	1	18	49	31	32	30
November	Car	60	41	144	116	112	100	89	53	58	123	133	104	83	110	47	54	112	144	115	129	113	52	70	105	122	136	21	73	47	42	
	Truck	15	1	49	34	35	39	37	10	1	11	5	12	3	12	0	7	28	22	18	12	20	0	0	13	10	15	1	6	0	0	

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TABLE 3.4-2

BUS PASSENGER MILE REPORT SUMMARY 1980

Month		No. Half Trips Rifle to C-B	No. Half Trips C-B to Rifle	No. Half Trips Meeker to C-B	No. Half Trips C-B to Meeker	Total Passenger	Cummulative Total Passengers	Total Passenger Miles	Cummulative Total Passenger Miles
June	1980	152	152	90	90	6,532 1,464	6.532 1,464	13,680 8,618	13,690 8,613
July	1980	160	160	93	93	7,921 1,680	14,453 3,144	14,400 8,978	23,030 17,596
August	1980	156	156	93	93	7,577 1,999	22,030 5,143	13,416 8,928	41,496 26,524
September	1980	149	150	90	90	8,000 1,984	30,030 7,127	12,900 8,640	54,396 35,164
October	1980	163	163	89	87	8,355 1,608	38,385 8,735	14,018 8,544	68,414 43,708

TABLE 3 [illegible]-3

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA SUMMARY

MONTH	SITE	SAMPLE PERIOD	No. DAYS IN SAMPLE PERIOD	TOTAL CARS IN - OUT	AVG. CARS PER DAY IN - OUT	MAX. CARS PER HOUR
MAY	BT01	5/5/80 - 5/13/80	8	1893-1699	237-212	104
MAY	BT03	5/6/80 - 5/13/80	7	909-836	130 119	51
MAY	BT02	5/6/80 - 5/11/80	6	683-805	114-134	49
JUNE	BT03	6/23/80 - 6/30/80	7	1014-1026	145-147	49
AUG.	BT01	8/6/80 - 8/14/80	8	2510-2558	314-320	94
AUG.	BT03	8/5/80 - 8/14/80	9	1496-1456	166-162	69
AUG.	BT02	8/5/80 - 8/14/80	9	1270-1350	141-150	56
SEPT.	BT01	9/5/80 - 9/16/80	11	3259-3407	296-310	90
SEPT.	BT03	9/5/80 - 9/14/80	9	1515-1525	168-169	45
SEPT.	BT02	9/5/80 - 9/16/80	11*	1227-2426	153-221	245
OCT.	BT01	10/10/80 - 10/30/80	20	7518-7585	376-379	83
OCT.	BT03	10/10/80 - 10/30/80	20	4444-3795	222-190	137

* No data for 3 days - instrument malfunction

TABLE [illegible]-3 (cont.)

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA SUMMARY

MONTH	SITE	SAMPLE PERIOD	No. DAYS IN SAMPLE PERIOD	TOTAL CARS IN - OUT	AVG. CARS PER DAY IN - OUT	MAX. CARS PER HOUR
OCT.	BT02	10/10/80 - 10/31/80	21	3385-1855	161-88	69
NOV.	BT01	11/14/80 - 11/21/80	8	1916-2006	240-251	108
NOV.	BT02	11/14/80 - 11/21/80	7	1056-1069	151-153	64
NOV.	BT03	11/14/80 - 11/21/80	7	903-5723	129-818	92

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT01 PERIOD (5/ 5/80 to 5/13/80)

Reduced By
Date

Units Total Vehicle Count .- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																		2	3	3	3	3	2	7	23
6	0	0	0	0	1	1	55	52	12	17	27	16	15	9	16	8	10	3	5	3	1	2	12	8	273
7	1	0	0	0	0	1	56	58	19	23	19	11	26	20	22	14	7	5	3	1	5	1	4	7	303
8	0	0	0	0	1	3	61	59	15	17	14	10	11	15	18	19	8	3	4	5	3	2	7	5	280
9	0	0	0	2	0	0	59	54	7	17	11	5	3	8	12	18	9	4	5	7	1	0	11	5	238
10	0	0	0	0	0	1	16	26	14	8	11	6	2	7	12	10	5	5	4	7	1	0	7	5	147
11	3	0	0	0	0	1	8	15	2	3	4	4	1	5	14	11	5	2	3	3	3	2	5	7	101
12	0	0	1	0	1	4	56	104	12	14	10	13	17	8	18	11	6	4	4	1	3	3	7	5	302
13	1	0	1	0	0	3	50	62	15	16	18	14	10	10	19	7									226
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	5	0	2	2	3	14	361	430	96	115	114	79	85	82	131	98	50	28	31	30	20	13	55	49	1893

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT01 PERIOD (5/5 /80 to 5 /13/80)

Reduced By

Date

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																		57	14	9	5	2	1	2	90
6	11	1	0	0	0	0	1	6	7	10	7	12	7	15	7	16	44	54	19	7	3	1	2	2	232
7	15	1	0	0	0	0	1	4	20	9	11	7	15	12	22	28	53	45	13	3	1	7	3	2	272
8	16	5	0	1	1	0	2	4	8	16	9	11	12	10	16	9	58	51	8	15	8	9	1	1	271
9	18	1	1	0	0	1	4	5	14	6	9	8	10	12	10	19	65	45	16	8	3	3	0	2	260
10	10	4	0	0	0	0	0	1	10	8	7	6	9	4	9	7	22	21	7	3	6	1	1	1	137
11	10	1	1	0	0	0	1	5	15	3	3	2	7	7	5	3	20	3	4	2	3	3	1	0	99
12	10	4	0	0	0	0	1	5	7	11	7	11	8	17	8	10	49	49	9	1	2	0	0	0	209
13	18	4	1	0	0	1	3	9	12	6	9	9	16	9	12	20									129
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	108	21	3	1	1	2	13	39	93	69	62	66	84	86	89	112	311	325	90	48	31	26	9	10	1699

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (5/ 6/80 to 5/13/80)

Reduced
Date

Units Total Vehicle Count - Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6										0	7	18	7	5	5	8	4	4	4	4	2	2	1	2	73
7	0	0	0	0	0	1	19	25	16	9300	5	9300	7	9	11	15	11	33	17	8	1	1	1	0	180
8	3	3	3	0	0	1	0	1	4	5	9	5	6	4	7	10	8	43	18	4	7	2	3	0	146
9	2	5	0	0	0	0	0	0	6	7	2	9	10	7	3	10	14	39	18	5	13	7	1	1	159
10	3	3	0	0	0	0	0	1	4	4	7	9	4	4	13	1	5	5	5	5	0	7	0	0	80
11	1	4	1	1	0	0	0	0	1	10	0	2	2	5	2	6	7	7	7	2	4	3	0	0	65
12	1	2	1	1	0	0	0	1	7	8	8	5	17	2	9	14	17	51	23	14	4	5	2	1	193
13	4	5	1	1	1	1																			13
14																									
15																									
16																									
17																									
18																									
19																									
20																									
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22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	14	22	6	3	1	3	19	28	38	34	38	48	53	36	50	64	66	182	92	42	31	27	8	4	909

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (5/ 6/80 to 5/13/80)

Reduced By
Date

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6										0	3	14	6	7	14	9	36	16	7	6	8	3	0	3	132
7	5	1	0	0	0	0	2	6	12	9300	9	9300	3	8	8	7	5	4	3	2	1	0	4	1	81
8	0	0	0	1	0	2	19	24	14	8	10	7	4	13	5	11	3	3	6	3	2	0	1	1	137
9	0	0	0	0	0	1	24	28	20	13	6	6	5	4	5	5	3	7	5	5	0	2	2	0	141
10	0	0	0	0	0	0	7	12	6	9	2	4	1	0	3	7	10	4	7	1	0	1	5	2	81
11	0	0	0	0	0	0	7	5	6	2	0	9	2	8	5	4	2	3	4	0	2	3	4	4	70
12	0	0	0	0	1	1	21	25	12	15	9	9	2	5	11	17	13	10	15	2	5	2	5	4	184
13	5	1	1	1	1	1																			10
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	10	2	1	2	2	5	80	100	70	47	39	49	23	45	51	60	72	47	47	19	18	11	21	15	836

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT02 PERIOD (5/ 6/80 to 5 / 11/80)

Reduced By
Date

Units Total Vehicle Count.- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6										9	18	11	3	7	5	15	3	5	4	0	1	0	0	12	93
7	1	1	0	0	0	0	5	42	12	11	13	11	7	7	11	20	5	5	0	3	0	1	0	7	162
8	0	0	0	1	0	0	5	49	8	13	8	9	8	10	3	15	4	1	0	2	1	1	0	9	147
9	0	0	0	0	0	0	5	44	5	9	12	2	7	9	6	14	9	2	1	0	0	0	0	6	131
10	0	0	0	0	0	0	1	12	1	9	4	1	3	1	0	10	0	0	0	1	0	3	0	6	52
11	2	0	0	0	0	0	0	23	16	5	5	4	2	2	1	15	14	2	3	4					98
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
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25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	3	1	0	1	0	0	16	170	42	56	60	38	30	36	26	89	35	15	8	10	2	5	0	40	683

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT02 PERIOD (5/ 6/80 to 5/ 11/80)

Reduced By

Date

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6										7	7	10	8	10	10	12	29	12	4	2	5	1	1	0	118
7	8	0	0	0	0	0	0	12	20	14	16	6	8	15	14	18	35	7	4	2	0	1	0	0	180
8	11	1	0	0	0	0	5	9	14	11	12	12	15	11	7	11	41	12	3	5	1	1	2	4	188
9	9	0	0	1	0	0	1	4	11	3	8	5	6	6	9	15	41	10	5	2	2	4	2	4	149
10	11	0	0	0	0	0	0	1	9	6	2	5	5	1	2	5	9	2	6	3	1	1	3	3	75
11	9	0	0	0	0	0	4	12	17	7	3	2	4	3	1	15	13	2	3						95
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
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23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	48	1	0	1	0	1	10	38	71	48	48	40	46	46	43	76	168	45	25	14	9	8	8	11	805

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (6/23/80 to 6/30/80)

Reduced By

Date

Units Total Vehicle Count - Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23								29	31	13	12	3	11	7	6	9	3	3	7	2	3	6	2	4	151
24	3	0	0	1	1	0	1	26	37	13	17	9	15	10	5	9	8	6	4	10	2	3	1	5	186
25	1	3	0	0	0	0	3	23	28	10	17	8	8	5	10	5	11	6	3	7	4	0	4	3	159
26	4	1	0	1	0	0	3	29	19	3	10	12	9	13	6	5	8	4	6	3	3	1	0	3	143
27	7	0	0	0	0	3	4	20	21	13	10	11	5	8	7	8	6	6	4	4	4	2	4	7	154
28	1	1	0	2	1	0	4	4	10	4	8	5	2	10	4	7	6	5	3	5	4	5	2	5	98
29	4	3	0	3	0	0	1	6	3	2	4	5	2	5	5	2	7	7	1	4	6	3	2	4	79
30	0	0	0	0	0	5	5	34																	44
31																									
TOTAL	20	8	0	7	2	8	21	171	149	58	78	53	52	58	43	45	49	37	28	35	26	20	15	31	1014

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (6/23/80 to 6/30/80)

Reduced By ____________
Date ____________

Units Total Vehicle Count - Outgoing

DAY	HOUR 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23								3	7	9	11	7	8	14	7	8	14	49	15	7	4	2	3	4	172
24	2	1	1	0	1	0	0	2	5	12	8	7	9	15	6	11	18	40	14	10	6	4	3	1	176
25	0	5	0	0	0	1	2	0	4	7	16	5	9	11	9	8	12	35	12	11	4	0	2	4	157
26	0	4	2	0	0	0	2	1	7	5	5	5	10	13	7	13	12	34	12	10	2	1	6	0	151
27	4	4	0	0	0	0	1	2	3	6	6	5	9	9	13	8	11	44	8	4	8	1	6	2	154
28	3	4	0	0	0	0	1	1	2	7	0	4	8	3	11	5	17	14	4	17	1	3	1	2	108
29	5	3	0	3	1	0	0	0	1	8	4	2	6	7	3	6	5	8	4	8	3	4	1	4	86
30	0	3	0	0	0	2	3	14																	22
31																									
TOTAL	14	24	3	3	2	3	9	23	29	54	50	35	59	72	56	59	89	224	69	67	28	15	22	17	1026

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT01 PERIOD (8 / 6/80 to 8 /14/80)

Reduced By

Date

Units Total Vehicle Count .- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6											16	10	28	16	11	9	2	5	7	6	12	4	2	4	132
7	0	0	0	9	72	44	22	32	22	23	16	7	24	11	12	8	7	7	3	11	21	1	1	0	353
8	1	3	1	6	90	47	12	16	12	17	10	17	31	17	10	8	5	6	5	1	12	6	3	3	339
9	1	1	0	2	26	22	10	10	12	9	5	9	23	11	6	7	6	9	4	4	18	2	1	1	199
10	4	0	0	3	18	9	5	8	3	7	9	8	20	19	4	7	2	8	3	3	16	2	2	1	161
11	1	1	1	8	72	36	22	23	21	20	19	15	18	5	12	8	10	12	4	4	19	6	2	1	340
12	1	1	0	7	76	53	15	12	20	19	15	21	25	12	9	10	8	3	6	6	15	4	1	1	340
13	0	0	2	9	72	51	20	19	19	16	21	22	30	12	12	9	5	9	4	6	14	5	1	1	359
14	0	1	0	6	72	50	26	19	23	15	16	18	29	12	IM	IM									287
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	8	7	4	50	498	312	132	139	132	126	127	127	228	115	76	66	45	59	36	41	127	30	13	12	2510

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT01 PERIOD (8/6 /80 to 8/14/80)

Reduced By ____________
Date ____________

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6											14	16	21	25	83	48	29	6	8	3	2	6	16	1	278
7	1	0	1	0	4	8	18	13	11	19	19	14	25	23	91	50	12	10	6	1	2	1	21	3	353
8	3	2	1	0	4	2	21	10	10	19	17	20	14	27	94	51	19	10	7	2	7	6	18	1	365
9	2	3	1	0	1	2	13	10	2	5	12	7	10	16	42	8	12	7	4	7	4	11	12	0	191
10	3	0	0	1	1	3	22	2	8	5	5	12	15	18	20	10	4	3	2	6	4	1	21	1	167
11	1	0	0	0	3	3	16	19	11	21	12	18	13	19	67	36	17	15	6	4	5	2	14	1	303
12	1	0	0	1	0	8	29	12	11	22	15	14	23	28	79	38	25	5	12	3	5	4	13	1	349
13	1	0	1	5	4	4	28	11	9	11	28	15	24	36	66	59	24	10	6	5	3	9	13	2	374
14	2	1	0	1	5	4	19	18	11	22	16	27	19	33	IM	IM									178
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	14	6	4	8	22	34	166	95	73	124	138	143	164	225	542	300	142	66	51	31	32	40	128	10	2558

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (8/ 5/80 to 8/14/80)

Reduced By ____________
Date ____________

Units Total Vehicle Count - Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																		0	7	1	5	2	8	2	25
6	1	3	0	0	0	2	22	30	17	18	21	10	5	16	11	14	7	3	4	9	1	7	4	2	207
7	0	0	0	0	2	6	22	36	7	19	10	12	13	10	12	15	4	5	2	5	2	9	4	8	203
8	3	0	2	1	2	0	26	19	14	13	13	5	5	10	9	12	6	1	7	3	4	1	3	1	160
9	0	0	1	3	0	1	17	9	3	2	5	6	7	2	5	9	6	0	1	3	3	1	7	3	94
10	0	2	0	0	0	2	7	4	3	5	2	7	6	4	6	6	4	1	5	4	3	0	4	2	77
11	5	0	0	0	0	0	16	26	5	9	14	11	13	7	19	18	7	2	3	4	2	0	3	1	165
12	2	0	0	0	2	4	17	30	13	16	16	9	11	6	10	14	5	5	3	4	2	4	8	0	181
13	2	0	0	0	0	2	19	18	10	30	22	69	10	8	10	13	14	6	3	7	1	1	3	2	250
14	1	1	0	0	1	1	18	17	15	8	10	6	11	15	23	7									134
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	14	6	3	4	7	18	164	189	87	120	113	135	81	78	105	108	53	23	35	40	23	25	44	21	1496

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (8/5 /80 to 8/14/80)

Reduced By

Date

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																		0	7	6	7	6	2	1	29
6	3	1	0	0	1	1	2	4	15	6	12	11	14	8	19	15	51	15	12	16	4	7	1	5	223
7	4	1	0	0	0	0	4	4	11	12	13	17	18	10	12	13	28	21	9	5	4	3	3	5	197
8	4	1	0	1	0	0	4	4	6	10	7	12	14	10	14	9	29	22	14	5	12	3	1	3	185
9	5	0	0	0	0	0	0	2	3	4	2	2	7	5	7	5	17	18	5	3	3	3	1	1	93
10	2	1	1	0	0	1	0	1	7	1	7	2	2	4	3	4	13	5	8	7	4	5	2	3	83
11	2	0	2	0	0	1	2	8	8	11	11	9	13	14	11	6	32	12	13	2	2	3	1	4	167
12	9	0	0	0	1	0	3	1	14	7	13	11	13	12	14	6	33	9	12	13	2	5	3	4	185
13	2	1	0	0	0	0	2	3	12	18	11	42	12	15	8	12	24	19	18	6	4	1	2	4	216
14	4	0	0	0	0	0	1	2	9	7	5	10	10	8	12	10									78
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	35	5	3	1	2	3	18	29	85	76	81	116	103	86	100	80	227	121	98	63	42	36	16	30	1456

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT02 PERIOD (8 / 5/80 to 8/14/80)

Reduced By ____________
Date ____________

Units Total Vehicle Count .- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																	0	2	1	3	0	1	0	12	19
6	0	0	1	0	0	1	4	45	10	9	14	11	5	10	3	23	2	1	2	0	0	2	1	12	156
7	1	0	0	0	0	1	1	49	14	11	9	15	8	5	9	14	5	3	3	4	0	3	3	8	166
8	1	0	0	0	0	0	4	55	10	9	10	3	8	9	12	23	7	4	3	0	3	0	1	6	168
9	0	1	0	0	1	0	1	15	4	5	2	4	3	1	3	17	5	2	2	1	2	0	4	11	84
10	0	0	0	0	0	0	0	13	3	3	3	0	0	2	3	11	2	2	0	0	4	0	0	8	54
11	1	0	0	0	0	1	4	37	13	14	7	8	8	15	6	11	1	4	0	0	0	0	1	9	140
12	0	0	0	0	0	1	3	56	8	10	15	13	8	12	9	15	6	3	0	1	1	2	1	10	174
13	1	0	0	0	2	0	8	47	10	11	10	8	11	10	11	12	10	3	5	2	0	2	1	5	169
14	1	1	0	0	2	1	7	35	21	13	11	8	9	14	2	15									140
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	5	2	1	0	5	5	32	352	93	85	81	70	60	78	58	141	38	24	16	11	10	10	12	81	1270

STEVENS PPRII PRINT - PUNCH TRAFFïC RECORDER DATA

STATION BT02 PERIOD (8/ 5/80 to 8/14/80)

Reduced By

Date

Units Total Vehicle Count - Outgoing

DAY	HOUR 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																	10	1	3	4	0	0	0	10	28
6	0	0	0	0	0	0	4	11	9	10	13	7	7	10	27	42	8	2	3	3	0	2	5	6	169
7	0	0	0	0	0	0	5	14	8	11	10	15	9	6	11	42	13	2	5	3	2	4	1	11	172
8	1	1	0	1	0	1	7	9	7	8	12	13	13	13	19	52	8	6	3	4	0	0	2	11	191
9	1	2	0	0	0	0	0	8	3	4	1	5	3	4	4	20	3	4	1	2	3	3	4	9	84
10	0	0	0	0	0	0	2	14	2	2	0	0	5	5	4	12	7	0	0	1	4	0	3	11	72
11	0	0	0	0	0	1	1	14	11	12	10	8	10	8	9	35	7	3	3	0	3	0	2	9	146
12	1	0	0	0	1	1	6	16	11	11	11	11	8	14	12	41	10	2	5	8	4	2	2	9	186
13	0	0	0	0	0	0	7	22	7	6	10	9	15	12	17	36	12	6	9	2	2	0	4	10	186
14	1	0	0	0	0	3	5	15	11	8	12	8	13	11	8	21									116
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	4	3	0	1	1	6	37	123	69	72	79	76	83	83	111	301	78	26	32	27	18	11	23	86	1350

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT01 PERIOD (9 /5 /80 to 9 /16/80)

Reduced By

Date

Units Total Vehicle Count .- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5													0	17	14	30	79	53	26	14	10	4	4	4	255
6	17	5	2	0	0	2	4	8	17	9	4	11	11	11	12	11	43	37	22	10	9	4	1	0	250
7	13	7	0	2	1	2	4	1	15	8	7	7	7	4	12	15	26	19	20	4	7	1	0	1	183
8	9	5	0	0	1	0	3	6	22	15	10	13	16	16	13	31	67	57	27	13	7	6	0	3	340
9	17	2	2	1	1	4	3	6	20	18	6	19	17	18	22	29	77	55	40	7	7	4	5	2	382
10	19	2	0	2	1	0	5	7	21	8	11	13	21	10	31	31	80	58	22	8	5	2	6	0	363
11	13	1	1	1	0	0	7	7	17	7	15	15	17	13	23	19	84	76	38	15	8	8	3	2	390
12	16	6	3	2	0	0	8	4	22	10	12	16	18	15	22	31	0	33	26	12	4	1	2	13	276
13	6	0	1	0	0	1	4	13	13	8	12	16	16	6	11	40	31	26	24	7	10	0	4	17	266
14	3	1	1	0	4	1	5	14	6	5	16	9	10	12	11	24	23	17	18	6	3	2	2	17	210
15	5	0	0	0	0	0	2	15	15	9	18	15	12	9	13	61	53	37	20	13	6	1	1	18	323
16	3	2	1	1	5	5	4																		21
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	121	31	11	9	13	15	49	81	168	97	111	134	145	131	184	322	563	468	283	109	76	33	28	77	3259

STEVENS PPRII PRINT - PUNCH TRAFFïC RECORDER DATA

STATION BT01 PERIOD (9/ 5/80 to 9/16/80)

Reduced By

Date

Units Total Vehicle Count - Outgoing

	HOUR																								
DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5												0	15	30	24	13	5	10	6	10	2	18	8	4	145
6	2	0	1	0	5	52	35	15	14	7	8	5	14	16	16	6	6	6	4	0	6	10	8	0	236
7	1	1	1	2	3	23	20	9	2	9	9	5	11	17	5	14	11	9	8	3	5	20	5	3	196
8	2	0	1	1	8	78	65	18	19	15	22	11	19	25	19	17	7	7	8	6	3	17	4	0	372
9	0	1	1	5	10	79	67	25	28	26	15	23	25	19	11	10	13	7	8	5	6	18	7	2	411
10	2	2	0	4	8	82	72	15	18	18	30	11	12	13	14	11	8	3	9	5	7	16	4	1	365
11	0	0	0	1	5	89	80	24	22	10	21	19	19	29	16	12	10	10	8	4	3	16	3	3	404
12	2	2	0	1	6	90	68	20	14	13	22	11	19	28	12	0	9	4	8	5	15	6	5	1	361
13	1	0	2	10	53	45	9	11	9	13	8	2	23	20	8	8	8	6	2	1	10	5	1	2	257
14	1	0	1	5	34	31	12	8	5	6	4	6	23	16	9	4	6	7	5	9	10	11	1	3	217
15	0	1	1	6	69	69	17	23	16	12	12	11	26	22	10	10	3	7	9	8	9	10	0	1	352
16	1	0	2	7	69	12																			91
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	12	7	10	42	270	650	445	168	147	129	151	104	206	235	144	105	86	76	75	56	76	147	46	20	3407

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (9/ 5/80 to 9/14/80)

Reduced By

Date

Units Total Vehicle Count .- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																		0	7	4	7	0	0	6	24
6	3	1	1	0	0	1	5	12	12	11	7	11	10	7	3	9	6	4	3	3	8	1	1	3	122
7	4	6	0	0	0	2	0	8	5	5	9	5	0	7	5	4	6	4	9	1	4	2	1	6	93
8	4	4	1	1	2	2	1	25	17	11	12	10	11	6	15	14	14	10	7	4	6	1	2	7	187
9	1	1	1	2	0	1	3	15	22	10	10	12	6	14	12	9	12	6	8	4	6	1	4	7	167
10	2	1	0	1	0	1	2	19	50	16	25	27	45	32	14	25	13	3	2	4	4	3	0	3	292
11	4	1	1	0	2	1	6	14	24	18	16	16	12	16	13	15	15	6	7	4	1	2	2	5	201
12	1	1	0	2	1	0	6	16	27	5	15	16	8	18	7	14	12	10	8	5	4	3	0	7	186
13	1	1	0	1	1	0	3	10	28	6	10	39	22	20	16	26	18	17	6	3	4	4	2	2	240
14	3	- -	- -	- -	- -	- -	- -	-	9500	- -	- -	- -	- -	- -	- -	- -	- -								3
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	23	16	4	7	6	8	26	119	185	82	104	136	114	120	85	116	96	60	57	32	44	17	12	46	1515

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (9/5 /80 to 9 /14/80)

Reduced By ________

Date ________

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																		0	14	16	4	4	3	2	43
6	2	6	1	0	1	0	0	2	3	8	8	6	9	5	10	13	7	11	15	5	3	5	2	2	124
7	2	5	2	0	0	0	0	1	1	8	4	7	5	4	7	7	7	10	11	8	2	3	2	0	96
8	3	4	1	0	0	0	1	3	13	10	11	9	7	12	15	11	5	17	17	18	5	5	6	2	175
9	2	9	2	1	0	0	1	3	5	10	12	5	9	15	8	10	12	35	32	15	5	1	0	3	195
10	2	10	1	1	0	0	0	0	18	16	16	5	10	9	11	17	18	38	35	9	4	8	3	1	232
11	0	8	2	2	0	0	0	2	5	10	11	8	15	7	14	20	26	27	21	20	10	7	1	0	216
12	0	7	1	1	0	0	2	1	7	13	8	12	9	7	13	13	12	28	22	14	4	1	5	1	181
13	0	7	0	0	1	1	2	2	6	9	24	21	34	20	26	16	30	25	12	14	5	4	2	2	263
14	0	9500	9500														9500								
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	11	56	10	5	2	1	6	14	58	84	94	73	98	79	104	107	117	191	179	119	42	38	24	13	1525

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT02 PERIOD (9 / 5 /80 to 9 /16/80)

Reduced By

Date 12/24/80

Units Total Vehicle Count .- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																	0	10	14	5	4	2	0	3	38
6	13	1	0	1	0	0	1	8	8	6	0	3	5	2	2	5	18	17	7	2	0	1	0	2	102
7	9	1	0	1	1	0	1	6	10	2	3	4	4	6	7	4	16	12	1	2	0	0	1	1	92
8	12	1	0	1	0	0	6	9	21	11	6	6	11	5	4	19	41	8	12	1	2	1	2	2	181
9	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	9	3	0	0	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
10	0	8	0	0	0	2	1	1	8	0	4	9	6	7	10	13	16	42	15	0	2	4	1	5	154
11	4	8	0	0	1	0	1	2	5	21	9	9	10	8	8	12	18	43	18	21	14	1	0	2	215
12	1	12	0	0	0	0	1	3	5	19	7	5	6	11	9	11	8	43	12	19	5	0	0	3	180
13	2	10	1	0	0	0	0	2	1	8	5	2	1	2	1	3	3	19	8	19	3	0	1	2	93
14	4	10	11	7	4	1	1	2	32	17	7	8	5	11	5	5	21	21	- -	- 9300 -		- -	- -	-	172
15	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	9	3	0	0	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
16	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	9	3	0	0	- -	- -	- -	- -							
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	45	51	12	10	6	3	12	33	90	84	41	46	48	52	46	72	141	215	87	69	30	9	5	20	1227

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT02 PERIOD (9/ 5/80 to 9/16/80)

Reduced By
Date 12/24/80

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																	3	1	3	2	2	1	7	1	20
6	0	0	0	1	0	11	25	4	6	4	1	3	1	2	8	2	2	2	2	0	0	0	10	0	84
7	0	0	0	0	0	3	16	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	23
8	0	0	0	0	0	1	12	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	96
9	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	9	3	0	0	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
10	159	178	177	188	158	179	190	245	0	12	10	12	9	6	4	15	4	1	1	3	0	0	1	10	1568
11	2	1	0	0	0	0	22	52	20	9	14	5	7	12	12	16	2	6	5	3	0	0	2	10	200
12	0	0	0	0	0	0	21	59	12	8	6	5	2	5	5	17	1	4	4	1	1	0	0	10	161
13	1	1	1	0	0	0	16	29	4	5	1	2	2	1	0	16	2	3	3	1	0	0	1	6	95
14	0	10	7	5	4	1	15	29	17	7	8	5	11	5	5	21	21	8	- -	- -	9300	- -	- -	- -	179
15	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	9	3	0	0	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
16	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	9	3	0	0	- -	- -	- -	- -							
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	162	190	185	194	162	195	317	502	60	45	41	33	32	31	34	87	35	25	24	10	3	1	21	37	2426

STEVENS PPRII PRINT - PUNCH TRAFFiC RECORDER DATA

STATION BT01 PERIOD (10 / 10/80 to 10 / 30/80)

Reduced By
Date

Units Total Vehicle Count - Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																	1	0	49	24	24	9	3	9	119
11	4	13	2	1	0	0	0	2	2	8	10	6	9	4	18	19	15	30	19	27	32	7	3	3	234
12	1	14	1	0	0	0	2	0	1	10	13	9	13	10	11	22	20	29	24	22	8	1	9	0	220
13	0	7	5	2	1	3	1	5	5	19	18	13	18	20	24	19	28	62	60	30	19	8	7	1	375
14	3	9	1	3	0	2	0	4	12	23	18	20	22	26	25	21	27	68	54	32	22	13	7	1	413
15	0	10	4	2	0	1	0	2	9	22	14	14	20	17	30	15	33	77	62	29	15	1	2	1	380
16	1	15	3	0	0	0	0	0	5	20	33	16	18	23	22	24	21	63	42	31	17	10	5	2	371
17	1	14	10	1	1	0	0	0	8	8	10	21	12	16	20	20	30	60	48	20	16	4	4	3	327
18	5	12	3	0	0	0	3	6	3	12	10	8	8	12	9	6	19	36	26	24	6	7	4	2	221
19	1	10	2	0	1	1	0	3	5	17	3	0	7	14	8	12	18	34	13	15	12	5	2	1	184
20	0	15	6	0	0	0	1	5	4	13	13	8	19	13	14	20	24	62	76	19	10	7	2	0	331
21	2	18	2	1	0	0	3	0	6	16	14	15	15	11	15	19	20	83	70	32	15	9	3	2	371
22	1	20	3	0	1	0	0	3	8	18	16	10	10	22	16	20	31	79	23	12	12	2	2	2	311
23	15	4	1	0	0	0	0	10	22	11	15	21	36	19	23	32	96	56	28	32	15	5	3	0	444
24	15	6	1	0	0	0	0	7	25	24	23	20	27	28	39	33	91	51	40	17	8	6	2	2	465
25	19	8	0	2	2	5	2	2	25	12	16	17	21	30	29	34	53	25	32	36	21	7	2	1	401
26	8	1	0	0	0	7	2	12	10	22	25	33	39	33	57	38	27	44	36	40	15	20	7	0	476
27	2	10	7	0	1	0	1	3	15	39	38	42	55	45	31	51	36	78	57	32	11	8	5	2	569
28	1	9	5	0	2	4	1	4	17	32	28	25	42	36	29	45	29	83	46	46	20	12	4	2	522
29	5	13	4	1	1	0	2	9	8	33	22	24	34	37	45	39	37	79	56	45	19	10	5	2	530
30	2	15	2	1	0	1	1	10	13	25	24	19	27	28	20	24	42								254
31																									
TOTAL	86	223	62	14	10	24	19	87	203	384	363	341	452	444	485	513	698	1099	861	565	317	151	81	36	7518

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT01 PERIOD (10/10/80 to 10/30/80)

Reduced By

Date

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																0	0	18	11	7	11	5	18	7	77
11	2	0	0	1	6	12	37	34	11	6	9	9	9	4	10	16	12	7	10	7	3	4	11	4	224
12	4	0	1	0	3	13	23	20	8	10	14	15	7	10	17	16	7	5	7	7	5	5	9	9	215
13	0	1	0	4	1	12	59	56	20	16	25	17	17	16	25	23	16	8	12	5	5	3	14	8	363
14	1	1	0	1	1	4	57	79	30	26	13	16	15	15	27	20	9	10	8	8	5	10	10	9	375
15	3	2	2	1	0	8	57	80	24	18	19	18	18	11	23	20	9	10	6	10	1	5	10	4	359
16	0	0	1	0	1	2	57	83	28	24	22	13	13	12	19	22	17	11	11	5	2	1	7	3	354
17	5	1	0	0	1	3	37	65	18	21	17	12	12	21	13	20	13	11	9	7	6	2	6	5	305
18	1	1	1	0	0	3	35	28	16	12	5	8	7	5	14	8	12	7	2	10	8	5	11	6	205
19	1	1	1	0	0	3	23	23	8	6	11	7	5	7	23	13	10	6	5	4	4	4	12	5	182
20	4	0	0	0	0	6	55	83	19	20	19	15	8	19	31	22	9	9	6	5	4	2	11	4	351
21	1	0	1	0	2	2	43	82	26	21	23	17	21	14	20	22	14	11	11	8	4	6	14	6	369
22	1	3	0	0	1	4	45	74	27	28	20	21	15	14	24	16	19	6	6	12	7	14	3	0	360
23	0	1	0	4	3	53	84	33	31	33	40	34	48	43	37	45	18	16	10	13	13	14	11	3	587
24	1	3	3	0	4	46	94	32	39	40	44	49	62	72	55	44	47	45	24	14	32	40	19	10	819
25	10	3	3	10	17	41	39	15	11	9	20	12	25	28	28	22	16	9	20	12	8	13	10	1	382
26	0	1	0	1	3	12	30	19	10	15	18	19	21	14	47	21	21	16	14	14	6	10	14	5	331
27	3	2	0	4	4	13	65	68	21	29	32	24	23	17	35	29	17	11	14	8	11	5	10	6	451
28	0	1	2	0	4	9	71	70	27	21	28	22	27	9	34	20	28	15	9	11	6	3	13	5	435
29	0	3	0	0	0	10	64	79	30	23	22	26	20	7	22	27	22	15	6	17	1	7	18	4	423
30	2	1	0	1	0	2	59	79	23	23	31	32	32	47	36	34	16								418
31																									
TOTAL	39	25	15	27	51	258	1034	1102	427	401	432	386	405	385	540	460	332	246	201	184	142	158	231	104	7585

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (10 / 10/80 to 10 / 30/80)

Reduced By

Date 12-22-80

Units Total Vehicle Count.- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																	0	17	9	7	4	5	0	2	44
11	10	0	0	0	1	2	1	4	4	6	3	6	6	7	6	10	9	10	9	5	4	6	0	2	111
12	7	0	0	0	0	0	1	1	2	5	5	4	4	7	2	8	11	11	4	0	2	2	1	1	78
13	9	2	1	0	0	0	1	5	5	3	4	7	6	6	6	4	22	10	5	7	1	2	1	7	114
14	5	11	4	10	7	13	13	4	8	30	29	13	13	10	2	7	12	18	18	13	12	6	4	7	269
15	25	31	29	39	22	27	23	24	20	21	3	0	1	0	3	2	4	7	2	0	1	3	8	11	306
16	6	3	6	10	24	7	6	3	8	4	4	2	3	2	0	5	4	5	0	6	4	7	16	9	144
17	13	15	18	11	9	6	7	6	11	23	19	11	6	11	4	2	1	7	8	14	33	16	20	29	300
18	23	22	27	29	29	31	33	35	36	31	27	24	10	7	10	3	1	6	7	8	13	8	9	7	436
19	14	24	24	28	25	27	32	15	31	33	17	5	0	1	3	2	4	2	3	3	1	14	10	27	345
20	9	13	5	10	6	18	21	13	7	10	7	3	2	0	2	0	1	2	2	5	1	9	3	6	155
21	8	14	13	6	10	12	12	8	15	4	6	4	5	2	0	1	1	3	0	4	2	5	2	7	144
22	3	9	5	13	14	22	6	11	6	4	2	3	2	2	3	1	2	1	2	2	3	6	19	16	157
23	25	31	24	6	6	6	4	5	10	10	3	7	2	3	0	4	2	1	6	1	6	2	5	4	173
24	1	2	3	3	2	6	7	3	3	11	5	2	3	3	1	0	3	1	0	4	3	4	3	14	87
25	12	17	16	21	30	27	24	22	24	26	23	22	5	7	8	6	1	6	3	4	4	11	6	3	328
26	12	19	23	23	18	8	10	20	29	17	16	9	11	19	7	7	18	7	2	6	9	15	9	8	322
27	8	20	15	7	9	3	10	7	5	2	7	6	12	12	5	9	7	6	6	8	11	7	4	7	193
28	10	10	7	10	19	15	30	7	12	10	41	13	19	11	2	14	9	9	8	6	9	3	7	6	287
29	6	12	17	23	19	14	12	11	12	25	22	21	9	2	6	1	2	7	0	6	0	7	1	17	252
30	18	9	11	17	9	23	23	9	5	17	12	17	8	6	3	0	4	2	6						199
31																									
TOTAL	224	264	248	266	259	267	276	213	253	292	255	179	127	118	73	86	118	138	100	109	123	138	128	190	4444

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (10 10 80 to 10 30 80)

Reduced By
Date

Units Total Vehicle Count .- Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																	3	5	4	10	8	7	5	1	43
11	0	0	1	1	27	9	15	8	7	3	6	3	9	6	6	4	3	8	5	1	3	2	3	1	131
12	0	0	0	0	2	6	8	4	4	2	6	0	5	5	9	2	8	1	5	1	0	2	2	1	73
13	0	0	0	0	2	19	21	14	6	6	4	6	2	7	9	5	11	4	0	2	1	3	3	1	126
14	0	0	1	0	1	14	31	3	7	10	14	6	9	5	8	5	2	0	2	2	2	4	1	0	127
15	0	0	0	0	1	12	32	9	7	8	13	11	3	7	5	4	7	4	3	2	2	9	1	0	140
16	1	0	0	0	1	11	28	13	6	10	5	5	9	10	5	10	11	0	137	79	8	72	33	1	455
17	0	0	0	0	0	8	13	15	12	12	5	13	5	6	8	3	19	1	5	2	0	1	6	3	137
18	0	0	0	0	4	1	8	6	5	6	6	7	8	6	3	7	3	4	4	3	2	1	8	0	92
19	0	0	1	1	0	1	6	7	3	7	2	6	2	8	9	8	11	4	3	2	2	2	8	1	94
20	0	1	0	0	0	0	13	28	12	4	6	5	5	9	6	14	5	4	2	1	2	5	8	1	131
21	0	1	0	0	0	1	15	24	13	7	10	13	6	11	7	9	6	6	4	3	0	0	10	3	149
22	0	0	1	1	0	0	13	29	10	12	13	3	9	13	14	9	8	4	2	1	3	2	26	21	194
23	0	1	3	0	0	0	15	29	9	22	57	50	10	12	25	21	21	19	93	28	7	4	4	0	430
24	0	0	0	0	1	2	11	25	34	45	64	70	21	17	11	21	47	0	7	11	6	8	3	4	408
25	3	2	6	2	1	2	6	12	15	8	5	7	9	7	9	15	9	11	2	3	53	8	6	16	217
26	1	0	1	1	2	0	0	6	7	11	5	8	8	14	10	4	15	14	6	9	6	7	4	4	143
27	1	1	1	1	0	0	0	0	21	24	19	6	17	15	16	9	12	12	6	6	2	3	3	6	181
28	5	0	1	0	2	0	0	3	16	23	10	8	7	14	6	19	8	10	7	4	5	10	1	0	159
29	3	2	0	0	0	0	0	4	12	29	8	9	9	10	9	17	13	17	8	4	1	2	1	0	158
30	4	5	1	0	0	0	0	4	16	36	10	16	19	24	12	18	16	13	13						207
31																									
TOTAL	18	13	17	7	44	86	235	243	222	285	268	252	172	206	187	204	238	141	318	174	113	152	136	64	3795

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT02 PERIOD (10/10/80 to 10/31/80)

Reduced By
Date

Units Total Vehicle Count.- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10														0	3	4	15	5	10	8	4	5	1	2	57
11	1	0	0	0	0	0	0	2	9	2	3	2	0	0	0	0	0	0	0	0	0	0	1	0	20
12	11	10	5	0	3	4	2	1	2	1	4	2	3	5	1	4	10	6	6	5	0	0	0	2	87
13	0	0	1	0	0	0	0	0	10	1	4	3	0	0	0	0	0	0	0	0	1	1	0	0	21
14	8	8	2	4	1	1	1	1	1	2	3	0	1	0	3	0	10	1	6	5	1	1	0	1	61
15	2	0	0	0	0	2	0	0	9	0	0	1	0	0	0	0	0	3	1	1	0	0	1	3	23
16	22	24	10	13	3	6	6	7	6	6	8	6	6	5	8	8	15	13	11	5	10	4	3	2	207
17	2	1	2	0	0	0	0	2	8	0	1	1	0	0	0	0	0	2	1	0	0	1	4	6	31
18	26	28	10	7	12	15	16	8	8	5	7	10	7	6	4	6	12	7	10	9	8	4	4	0	229
19	0	1	4	2	1	3	0	0	11	4	3	2	2	1	0	0	0	0	0	0	0	1	1	6	42
20	24	30	16	14	5	8	7	7	6	5	4	15	7	4	4	3	20	8	14	8	5	4	5	3	226
21	0	1	1	2	0	1	1	1	6	1	4	4	0	0	0	0	0	0	0	0	0	1	0	5	28
22	10	9	0	6	0	0	2	7	48	19	30	11	10	7	8	11	14	26	9	0	5	0	2	2	236
23	8	6	0	2	4	2	0	5	51	24	16	11	13	10	8	17	21	21	9	6	4	1	8	2	249
24	14	7	0	0	0	0	0	5	55	23	12	18	9	10	8	16	36	37	9	6	4	1	0	3	273
25	13	6	0	0	0	0	0	3	22	11	7	2	4	1	3	4	14	9	4	4	3	1	0	0	111
26	9	5	0	0	0	0	0	0	3	19	6	1	5	3	6	4	5	15	6	0	3	2	3	1	96
27	1	10	8	0	0	1	5	0	7	57	29	11	21	10	11	12	18	23	18	9	3	6	1	0	261
28	2	8	2	0	0	0	0	3	8	67	20	16	21	15	29	12	22	22	21	9	10	4	1	1	293
29	3	14	0	7	0	0	0	2	9	56	25	24	15	16	16	9	8	26	24	10	8	8	1	1	282
30	4	6	5	1	0	1	0	6	11	69	16	19	15	14	11	23	20	18	16	15	6	4	2	1	283
31	4	12	5	0	6	12	11	8	12	55	18	11	17	25	24	28	21								269
TOTAL	164	186	71	58	35	56	51	68	302	427	220	170	156	132	147	161	261	242	175	100	75	49	38	41	3385

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT02 PERIOD (10/10/80 to 10/31/80)

Reduced By ____ ______

Date ______ ______

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10														3	3	2	4	14	7	4	0	2	8	1	48
11	0	1	3	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0	0	1	0	0	0	12
12	1	4	3	1	1	0	1	1	2	1	0	1	1	0	0	0	4	9	0	1	0	1	1	1	34
13	0	0	0	0	0	0	0	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
14	0	3	1	0	1	0	0	2	0	0	1	0	0	0	0	2	1	5	1	0	1	0	0	0	18
15	0	0	0	0	0	0	0	1	0	6	4	0	0	0	0	0	0	0	0	0	0	2	0	1	14
16	4	4	9	3	0	0	3	2	3	2	5	3	4	5	4	4	5	24	17	6	3	1	3	0	114
17	3	3	0	0	0	0	1	0	4	4	1	0	0	0	0	0	0	0	0	0	0	4	0	3	23
18	6	9	2	5	2	8	2	2	3	4	4	4	7	3	5	7	4	22	10	8	1	3	0	0	121
19	0	1	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3	0	1	9
20	0	1	2	10	3	3	6	1	6	2	4	3	5	4	3	5	5	18	13	4	2	1	3	2	106
21	3	1	0	1	0	0	1	2	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
22	1	13	7	1	3	4	8	6	8	11	6	2	4	4	4	7	5	20	10	2	1	0	2	1	130
23	7	0	0	0	1	0	0	1	16	11	9	5	11	11	14	10	35	8	4	2	2	2	3	2	154
24	9	0	0	0	0	0	0	5	9	5	8	7	8	7	13	11	15	8	3	3	4	0	0	6	121
25	9	0	0	0	0	0	0	3	11	4	1	2	1	3	1	4	16	2	0	1	0	0	0	0	58
26	5	0	0	0	0	0	0	1	3	9	2	0	3	4	3	2	2	10	0	0	0	2	1	0	47
27	0	8	0	0	0	0	0	0	9	17	9	5	6	8	11	4	13	31	5	6	2	2	0	2	138
28	0	5	0	0	0	2	0	2	4	11	8	14	4	9	14	12	13	34	5	10	1	1	1	2	152
29	0	5	1	0	0	0	0	2	6	19	5	12	9	18	18	6	8	30	7	1	4	3	0	1	155
30	2	5	0	0	0	0	0	2	12	14	9	3	15	12	9	12	22	33	10	6	2	3	1	0	172
31	5	7	2	3	8	10	7	6	10	16	6	10	17	24	28	21	26								206
TOTAL	55	70	31	24	20	27	29	39	109	156	83	71	95	115	130	109	178	268	92	54	24	30	23	23	1855

STEVENS PPRII PRINT - PUNCH TRAFFïC RECORDER DATA

STATION BT01 PERIOD (11/14/80 to11 /21/80)

Reduced By

Date

Units Total Vehicle Count - Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																		0	7	8	8	1	4	9	37
15	4	0	2	0	0	0	2	32	31	16	13	9	7	7	7	19	6	5	3	9	10	1	0	12	195
16	2	3	2	0	1	4	0	18	13	9	3	3	5	3	12	19	12	9	6	3	5	0	1	11	144
17	2	1	2	0	1	0	5	58	61	19	19	23	14	14	13	28	16	11	9	2	7	2	4	10	321
18	3	2	0	0	1	2	5	60	53	27	20	18	17	15	12	20	9	9	5	3	1	3	2	16	303
19	5	1	0	1	0	0	5	61	49	16	27	15	11	14	14	23	13	9	9	1	5	4	3	7	293
20	1	0	1	1	0	3	3	58	73	20	26	22	18	14	15	22	16	9	11	8	2	3	3	12	341
21	2	2	0	0	2	2	4	68	66	19	12	21	16	6	14	28	9	11							282
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	19	9	7	2	5	11	24	355	346	126	120	111	88	73	87	159	81	63	50	34	38	14	17	77	1916

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT01 PERIOD (11/14/80 to 11/21/80)

Reduced By
Date

Units Total Vehicle Count - Outgoing

	HOUR																								
DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																		0	48	16	6	2	2	1	75
15	6	13	4	0	1	1	0	1	2	20	8	13	9	10	10	12	8	39	20	14	5	1	2	3	202
16	4	16	0	0	0	1	0	1	2	11	2	11	4	5	3	10	13	25	11	8	6	3	0	1	137
17	2	13	2	0	1	0	1	2	2	14	14	8	12	20	19	21	29	87	38	17	5	4	1	5	317
18	0	14	1	0	0	0	3	3	5	15	21	17	12	19	7	14	25	87	43	19	4	1	3	1	314
19	2	14	0	0	0	0	0	3	8	20	12	13	9	20	14	19	21	75	48	14	10	6	2	1	311
20	3	15	1	0	0	0	0	2	3	20	9	13	17	18	14	18	37	89	48	17	6	6	4	3	343
21	0	17	2	4	2	1	2	6	6	20	13	14	18	19	31	17	22	108							307
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	17	102	10	4	4	3	6	18	28	120	79	94	81	111	98	111	155	510	256	105	42	23	14	15	2006

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT02 PERIOD (11/14/80 to 11/21/80)

Reduced By

Date

Units Total Vehicle Count .- Incoming

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																		0	4	5	0	1	1	0	11
15	3	12	0	0	0	1	0	1	3	16	3	4	4	3	2	6	1	18	3	3	2	0	0	1	86
16	1	12	0	0	0	0	0	2	3	10	1	3	6	7	1	2	7	22	3	1	2	1	0	7	91
17	2	11	0	0	0	0	0	2	3	18	10	14	11	16	4	18	17	42	12	4	0	1	0	3	188
18	0	11	0	0	0	0	1	1	5	15	15	6	20	10	12	9	12	47	13	6	1	0	2	0	186
19	1	9	0	0	0	0	0	2	8	21	7	9	10	9	13	10	16	47	4	3	3	1	1	2	176
20	3	11	0	0	0	0	1	1	5	13	12	4	15	15	6	18	17	49	6	3	2	2	2	0	185
21	2	12	1	0	1	0	1	1	7	16	13	8	13	19	15	5	19								133
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	12	78	1	0	1	1	3	10	34	109	61	48	79	79	53	68	89	225	45	25	10	6	6	13	1056

STEVENS PPRII PRINT - PUNCH TRAFFïC RECORDER DATA

STATION BT02 PERIOD (11/14/80 to 11/21/80)

Reduced By
Date

Units Total Vehicle Count - Outgoing

HOUR

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																		0	3	0	1	0	2	0	6
15	10	0	0	0	0	0	0	3	19	8	6	2	1	8	0	0	16	2	0	2	0	0	0	0	77
16	6	1	0	0	0	0	0	3	17	13	4	2	3	0	0	3	20	7	2	0	0	0	0	1	82
17	6	1	0	0	0	0	1	1	49	20	10	9	14	17	10	15	23	9	5	4	0	0	1	0	195
18	8	0	0	0	0	0	2	0	51	14	14	9	5	10	6	10	16	7	5	0	2	1	1	3	164
19	15	1	0	0	0	0	0	3	46	15	9	9	5	8	15	9	22	3	2	3	1	1	2	1	170
20	6	1	0	0	0	0	1	2	48	23	13	7	4	11	9	18	23	8	3	3	2	0	0	0	182
21	9	0	0	0	0	3	0	7	64	17	9	20	9	12	13	8	22								193
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	60	4	0	0	0	3	4	19	294	110	65	58	41	66	53	63	142	36	20	12	6	2	6	5	1069

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (11/ 14/80 to 11 /21 /80)

Reduced By
Date

Units Total Vehicle Count .- Incoming

DAY	HOUR 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																		0	3	2	1	2	1	6	15
15	2	1	0	0	0	1	0	7	19	9	8	11	7	6	8	5	9	6	0	2	2	1	1	4	109
16	5	1	1	0	0	1	1	3	14	11	9	1	5	4	8	17	3	4	3	1	1	1	1	6	101
17	1	0	0	0	0	1	1	7	30	15	11	11	8	8	1	10	9	6	5	4	0	1	1	4	134
18	5	0	1	0	0	1	0	11	17	16	16	9	12	11	6	14	9	10	3	2	1	0	3	5	152
19	5	0	0	1	1	1	0	12	27	9	17	8	7	5	3	9	5	5	5	2	2	1	1	6	132
20	1	0	0	0	1	0	1	13	21	14	15	13	14	13	11	9	8	6	4	1	3	0	1	3	152
21	1	0	1	1	0	1	1	8	26	14	16	9	3	7	5	9	6								108
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	20	2	3	2	2	6	4	61	154	88	92	62	56	54	42	73	49	37	23	14	10	6	9	34	903

STEVENS PPRII PRINT - PUNCH TRAFFIC RECORDER DATA

STATION BT03 PERIOD (11/14/80 to 11/21/80)

Reduced By
Date

Units Total Vehicle Count - Outgoing

	HOUR																							
DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																		0	9	52	25	20	41	17	164
15	40	43	71	51	52	37	29	36	34	30	35	58	33	10	11	14	13	12	21	15	22	27	41	30	765
16	30	57	45	65	46	41	68	44	50	37	20	22	20	8	10	18	25	14	21	12	23	20	21	43	760
17	27	37	50	54	56	51	63	68	92	63	38	26	11	7	5	9	12	7	17	28	23	44	49	46	883
18	53	58	69	72	87	57	74	58	87	79	37	25	16	10	16	14	10	7	6	9	28	52	36	53	1013
19	38	53	44	68	40	39	54	45	66	39	23	18	15	20	10	13	15	16	11	31	37	26	29	24	774
20	36	33	34	60	60	44	51	52	36	37	29	11	17	8	5	8	10	10	14	25	16	34	19	42	691
21	60	64	61	56	46	43	56	58	73	53	40	45	8	2	3	3	2								673
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
TOTAL	284	345	374	426	387	312	395	361	438	338	222	205	120	65	60	79	87	66	99	172	174	223	236	255	5723

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3.5 Geology

The surface geology report was presented in Quarterly Data Report #5 and in the Annual Summary and Trends Report.

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4.0 Data Automation

The enviromental data base at present is partially manual and partially computerized. For purposes of analysis, data specificity, data security, and data archiving, the data base is being further computerized. It is the intent that all "indicator variables" be entered into RAMIS (Rapid Access Management Information System). Toward this end computer codes have been designed for all environmental station locations.

This section presents the status of automated data base, station location data, and a cross-reference list of four-digit computer codes and station monitoring codes.

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4.1 Automation Status

This section presents the status of the automated data base for the C-b Tract environmental data on the Occidental Petroleum Corporation computer system in Houston, Texas.

RAMIS II is a computerized data base management system (DBMS) used by Occidental Oil Shale, Inc. on the C-b Shale Oil Project via the Occidental Computer Center In Houston, Texas. C-b Shale Oil Tract environmental data are being prepared and entered into RAMIS DBMS as a means of making relevant data available for subsequent retrievals for use in reports and impact analyses. The use of this system provides an economical way to store and retrieve selected data in desired formats for reports and for input to analytic models requiring the data. Data are also archived within this system and through magnetic tapes containing the source raw data.

The following environmental data are entered into RAMIS DBMS as of May 1980:

Water Quality	
Springs and Seeps	October 1974 thru November 1980
Alluvial Wells	October 1974 thru November 1980
Upper Aquifer Wells	October 1974 thru November 1980
Lower Aquifer Wells	October 1974 thru November 1980
Well Water Levels	
Water Levels	October 1974 thru November 1980
Water Augmentation Plan	
Springs and Seeps	July 1979 thru November 1980
Upper Aquifer Wells	August 1979 thru November 1980
Lower Aquifer Wells	August 1979 thru November 1980
Precipitation	January 1979 thru November 1980
National Pollutant Discharge Elimination System	
Water Quality Data	July 1979 thru November 1980
Air Quality	
Small Trailer (Station AB21, AB22, AB24, AD42, AD56)	October 1974 thru November 1980
Large Trailer (Station AB20)	October 1974 thru November 1980
Large Trailer (Station AB23)	October 1974 thru November 1980
Meteorological Tower (Station AA23)	October 1974 thru November 1980
Biology	
Microclimate	October 1974 thru November 1980
Deer Kill	October 1977 thru November 1980
Deer Count	September 1977 thru November 1980

The status for the files are shown graphically in figures 4.1-1 through 4.1-9. File descriptions for the 14 files that reside in the RAMIS data base are shown in Tables 4.1-1 through 4.1-14.

Data collected and analyzed by USGS for stream flow and stream water quality are stored in government computer data bases in Reston, Virginia. These data bases (WATSTOR) and (NAWDEX) are accessed by dialing computer communications for retrievals of data to the Occidental Grand Junction computers for printing and analyses.

AIR QUALITY AND METEOROLOGICAL MONITORING/DATA BASE STATUS

PARTICULATE

		TRAILER		
YEAR	MONTH	020	023	056
80	1	X	X	X
	2	X	X	X
	3	X	X	X
	4	X	X	X
	5	X	X	X
	6	X	X	X
	7	X	X	X
	8	X	X	X
	9	X	X	X
	10	X	X	X
	11	X	X	X

PRECIPITATION

		TRAILER	
YEAR	MONTH	20	23
80	1	X	X
	2	X	X
	3	X	X
	4	X	X
	5	X	X
	6	X	X
	7	X	X
	8	X	X
	9	X	X
	10	X	X
	11	X	X

VISIBILITY

YEAR	MONTH	TRAILER AREA
80	5	X
	6	X
	7	X

ACOUSTIC RADAR

YEAR	MONTH	TRAILER 20
80	1	X
	2	X
	3	X
	4	X
	5	X
	6	X
	7	X
	8	X
	9	X
	10	X
	11	X

LARGE TRAILER

		TRAILER	
YEAR	MONTH	20	23
80	1	X	X
	2	X	X
	3	X	X
	4	X	X
	5	X	X
	6	X	X
	7	X	X
	8	X	X
	9	X	X
	10	X	X
	11	X	X

METEOROLOGICAL TOWER

YEAR	MONTH	TOWER 123
80	1	X
	2	X
	3	X
	4	X
	5	X
	6	X
	7	X
	8	X
	9	X
	10	X
	11	X

FILE MRIDATA

		STATION	
YEAR	MONTH	AD42	AD56
80	1	X	X
	2	X	X
	3	X	X
	4	X	X
	5	X	X
	6	X	X
	7	X	X
	8	X	X

BIOLOGY MONITORING/DATA BASE STATUS

DEER COUNT FOR 1980

YEAR
80
MONTH

LC	1	2	3	4	5	9	10	11	12
00		X		X		X	X		X
01	X	X	X	X					
02	X	X	X	X			X		
03			X	X					
04		X	X	X					
05		X	X	X			X	X	
06	X	X	X	X					
07	X	X	X	X					
08	X	X	X	X					
09	X	X	X	X			X		
10	X	X	X	X			X	X	
11	X	X	X	X			X	X	
12	X	X	X	X	X				
13	X	X	X	X			X	X	
14	X	X	X	X	X		X	X	
15		X	X	X	X		X	X	
16	X	X	X	X			X	X	X
17	X	X	X	X	X		X	X	
18	X	X	X	X	X		X	X	
19	X	X	X	X	X		X	X	
20	X	X	X	X	X		X	X	
21	X	X	X	X	X		X	X	
22	X	X	X	X	X			X	
23	X	X	X	X	X		X	X	
24	X	X	X	X	X		X	X	
25	X	X	X	X	X			X	
26	X	X		X				X	
27	X	X	X	X	X				
28	X	X	X	X	X			X	
29	X	X	X	X	X		X		
30	X	X	X	X	X		X		
31	X	X	X	X	X		X	X	X
32		X	X	X	X				
33	X		X	X	X		X		
34		X	X	X					
35	X	X	X	X					
36		X	X	X					
37	X	X	X	X					
38	X	X	X	X			X		
9	X	X	X	X	X				X
40				X	X		X	X	
41			X	X			X	X	

DEER KILL FOR 1980

YEAR
80
MONTH

MILE	1	2	3	4	5	9	10	11	12
BN00	X	X	X	X		X			
BN01	X	X	X	X	X		X		
BN02	X	X	X	X	X		X		
BN03	X	X	X	X	X				
BN04	X	X	X	X	X				
BN05	X	X	X	X	X				
BN06	X	X	X	X	X		X		
BN07	X	X	X	X	X				
BN08	X	X	X	X	X				
BN09	X	X	X	X	X		X		
BN10	X	X	X	X	X				
BN11	X	X	X	X	X				
BN12	X	X	X	X	X				
BN13	X	X	X	X	X			X	
BN14	X	X	X	X	X			X	
BN15	X	X	X	X	X			X	X
BN16	X	X	X	X	X				X
BN17	X	X	X	X	X				
BN18	X	X	X	X	X		X		
BN19	X	X	X	X	X				
BN20	X	X	X	X	X		X		
BN21	X	X	X	X	X		X		
BN22	X	X	X	X	X				
BN23	X	X	X	X	X				
BN24	X	X	X	X	X				
BN25	X	X	X	X	X				
BN26	X	X	X	X	X			X	
BN27	X	X	X	X	X				
BN28	X	X	X	X	X			X	
BN29	X	X	X	X	X				
BN30	X	X	X	X	X		X		
BN31	X	X	X	X	X				
BN32	X	X	X	X	X				
BN33	X	X	X	X	X		X		
BN34	X	X	X	X	X				
BN35	X	X	X	X	X				
BN36	X	X	X	X	X			X	
BN37	X	X	X	X	X		X	X	
BN38	X	X	X	X	X				
BN39	X	X	X	X	X				
BN40	X	X	X	X	X				
BN41	X	X	X	X	X				

BIOLOGY MONITORING/DATA BASE STATUS

TRAFFIC

YEAR	MONTH	STATION BT01	BT02	BT03
80	2	X	X	X
	3	X	X	X
	4	X	X	X

MICRO CLIMATE

YEAR	MONTH	STATION BC01	BC02	BC03	BC04	BC05	BC06	BC07	BC08	BC09	BC13
80	1	X	X	X	X	X	X	X	X	X	X
	2	X	X	X	X	X	X	X	X	X	X
	3	X	X	X	X	X	X	X	X	X	X
	4	X	X	X	X	X	X	X	X	X	X
	5	X	X	X	X	X	X	X	X	X	X
	6	X	X	X	X	X	X	X	X	X	X
	7	X	X	X	X	X	X	X	X	X	X
	8	X	X	X	X	X	X	X	X	X	X
	9	X	X	X	X	X	X	X	X	X	X
	10	X	X	X	X	X	X	X	X	X	X
	11	X	X	X	X	X	X	X	X	X	X
	12	X	X	X	X	X	X	X	X	X	X

HYOROLOGY MOINTIORING/DATA BASE STATUS/
WATER LEVELS

SPRINGS & SEEPS

YEAR	MONTH	LOC WS01	WS02	WS03	WS04	WS06	WS07	WS08	WS09	WS10	WS11	WS12	WS21	WS22
80	1	X	X	X	X	X	X	X	X	X			X	X
	2	X	X	X	X	X	X	X	X	X			X	X
	3	X	X	X	X	X	X	X	X	X			X	X
	4	X	X	X	X	X	X	X	X	X	X		X	X
	5	X	X	X	X	X	X	X	X	X	X		X	X
	6	X	X	X	X	X	X	X	X	X	X	X	X	X
	7	X	X	X	X	X	X	X	X	X	X	X	X	X
	8	X	X	X	X	X	X	X	X	X	X	X	X	X
	9	X	X	X	X	X	X	X	X	X	X	X	X	X
	10	X	X	X	X	X	X	X	X	X	X	X	X	X
	11	X	X	X	X	X	X	X	X	X	X	X	X	X

SPRINGS & SEEPS

YEAR	MONTH	WS23	WS24	WS25	WS26	WS27	WS28	WS29	WS30	WS31	WS32	WS33	WS34	WS35	WS36
80	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	4	X	X		X	X	X		X	X	X	X	X	X	X
	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	6	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	7	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	9	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	10	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	11	X	X	X	X	X	X	X	X	X	X	X	X	X	X

UPPER AQUIFERS

YEAR	MONTH	LOC WX01	WX02	WX04	WX10	WX11	WX12	WX14	WX17	WX18	WX19	WX20	WX21	WX32	WX33
80	1		X	X	X	X	X		X	X	X	X	X		
	2		X	X			X		X	X	X	X	X		
	3		X	X			X		X	X	X	X	X		
	4		X				X			X	X	X	X		
	5		X				X		X	X	X	X	X	X	X
	6			X			X		X	X			X	X	X
	7		X	X		X	X		X	X	X	X		X	X
	8		X	X			X	X	X			X	X	X	X
	9		X	X		X	X	X	X	X	X		X	X	X
	10	X									X	X		X	X
	11										X	X		X	X

UPPER AQUIFERS

YEAR	MONTH	LOC WX41	WX44	WX55	WX63	WX64	WX65	WX67	WX69	WX71	WX72	WX73	WX75	WX79	WX92
80	1		X	X	X	X	X	X	X	X	X	X	X		X
	2	X	X	X	X	X	X	X	X	X	X	X	X		X
	3		X		X	X	X	X	X	X	X	X	X		X
	4		X	X	X	X	X	X	X	X	X	X	X	X	X
	5		X	X	X	X	X	X	X	X	X	X	X		X
	6					X	X	X	X	X	X	X	X		X
	7		X	X	X	X	X	X	X	X	X	X	X		
	8		X	X	X	X	X	X	X	X	X	X	X		X
	9		X	X	X	X	X	X	X	X	X	X	X		X
	10				X	X	X	X	X	X	X	X	X		
	11					X	X	X	X	X	X	X	X		

LOWER AQUIFERS

YEAR	MONTH	LOC WY01	WY03	WY12	WY17	WY45	WY46	WY51	WY52	WY54	WY61	WY62	WY64	WY65
80	1	X	X	X	X	X	X		X	X	X	X	X	X
	2	X	X	X	X	X	X		X	X	X	X	X	X
	3	X		X	X	X	X				X	X	X	X
	4	X		X		X	X		X	X	X	X	X	X
	5	X		X	X	X	X		X	X	X	X	X	X
	6	X		X	X								X	X
	7	X		X	X	X	X		X	X	X	X	X	X
	8	X		X	X	X	X	X	X	X	X	X	X	X
	9	X		X	X	X	X		X	X	X	X	X	X
	10	X									X	X	X	X
	11												X	X

LOWER AQUIFERS

YEAR	MONTH	WY66	WY67	WY68	WY69	WY70	WY71	WY72	WY75	WY76	WY77	WY78	WY79	WY81	WY91
80	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	2	X	X	X	X	X	X	X	X	X	X	X	X		X
	3	X	X	X	X	X	X	X	X	X	X	X	X		X
	4	X	X	X	X	X	X	X	X	X	X	X			X
	5	X	X	X	X	X	X	X	X	X	X	X	X		X
	6	X	X	X	X	X	X	X	X	X	X	X	X		X
	7	X	X	X	X	X	X	X	X	X	X	X	X		
	8	X	X	X	X	X	X	X	X	X	X	X	X		X
	9	X	X	X	X	X	X	X	X	X	X	X	X		X
	10	X	X	X	X	X	X	X	X	X	X	X			
	11	X	X	X	X	X	X	X	X	X	X	X			

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HYDROLOGY MONITORING/DATA BASE STATUS/ WATER LEVELS

ALLUVIAL WELL

YEAR	MONTH	LOC WA01	WA02	WA03	WA04	WA05	WA06	WA07	WA08	WA09	WA10	WA11	WA12	WA13	WA55	WA56
80	1	X	X	X	X	X	X	X	X	X	X		X	X	X	
	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	3					X			X				X			
	4	X	X	X	X		X	X	X	X	X	X	X	X		
	5	X	X	X	X	X	X		X	X			X		X	
	6		X	X	X											
	7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	8	X	X	X	X	X	X	X	X	X		X	X	X		
	9														X	X
	10	X	X	X	X	X	X	X	X	X	X	X	X		X	X
	11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

COMPOSI WELLS

YEAR	MONTH	WV01	WV02	WV03	WV04	WV05
80	1	X	X	X	X	X
	2	X	X	X	X	X
	3	X	X	X	X	X
	4	X	X	X	X	X
	5	X	X	X	X	X
	6	X	X	X	X	X
	7	X	X	X	X	X
	8	X	X	X	X	X
	9	X	X	X	X	X
	10	X	X	X	X	X
	11	X	X	X	X	X

UPPER AQUIFERS

YEAR	MONTH	WD10	WE10
80	2		X
	3	X	X
	4		X
	5	X	X
	7	X	X
	8	X	X
	9	X	X
	10	X	X

SEEPAGE AND MONITORING WELLS

YEAR	MONTH	WW12	WW13
80	1	X	X
	2	X	X
	3	X	X
	4	X	X
	5	X	X
	6	X	X
	7	X	X
	8	X	X
	9	X	X
	10	X	X
	11	X	X

HYDROLOGY MONITORING/DATA BASE STATUS/ WATER QUALITY

ALLUVIAL WELLS

YEAR	MONTH	LOC WA01	WA02	WA03	WA05	WA06	WA07	WA08	WA09	WA12	WA56
80	2	X	X	X	X	X			X		
	4	X	X	X					X	X	
	5				X	X		X			
	7	X	X	X	X	X	X	X	X	X	
	8										X

SPRINGS AND SEEPS

YEAR	MONTH	LOC WS01	WS02	WS03	WS04	WS06	WS07	WS08	WS09	WS10	WS11	WS12	WS36	WS66
80	1	X	X	X	X	X	X	X	X	X				
	4	X	X	X	X	X	X	X	X	X			X	
	7	X	X	X	X	X	X	X	X	X	X	X	X	X
	10	X	X	X	X	X	X		X	X	X	X	X	

UPPER AQUIFERS

YEAR	MONTH	LOC WX02	WX04	WX14	WX18	WX21	WX55	WX82	WX92
80	6	X	X		X	X	X	X	X
	8			X					

LOWER AQUIFERS

YEAR	MONTH	LOC WG10	WY01	WY12	WY17	WY45	WY46	WY54	WY81	WY91
80	5		X	X						X
	6	X	X	X	X	X	X	X	X	X

HYDROLOGY MONITORING/DATA BASE STATUS NPDIS DATA

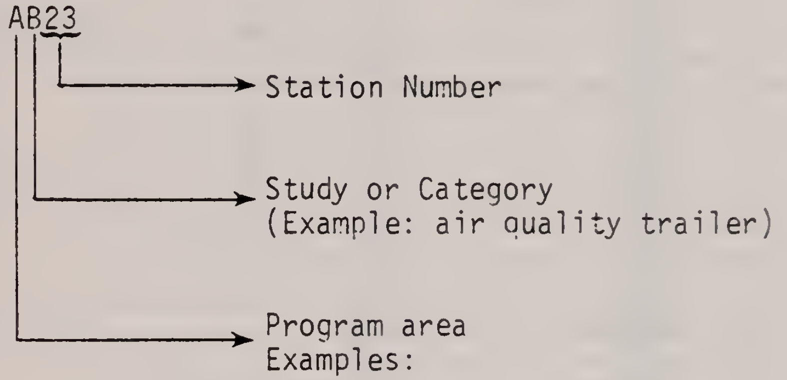
LOCATION	MONTH 1	2	3	4	5	6	7	8	9	10	11
WN40	X	X	X	X	X	X	X	X	X	X	X

SEEPAGE AND MONITORING WELLS

YEAR	MONTH	LOC WW12	WW13
80	6	X	X
	7	X	X
	8	X	X

4.2 Station Computer Code

Four-digit computer codes have been designated for monitoring stations to be used with a computerized data base management system (RAMIS). A major portion of the raw data collected at the C-b Tract is retained in RAMIS. Once entered the data can be retrieved for reporting and/or statistical analysis. The codes reduce storage space and provide a systematic identification to access station data sets. The code consists of two letters followed by two numbers:



A = air
N = noise
W = water
B = biology
P = photography

The codes are presented in Table 4.2-1 for the environmental program along with the current station designations. An attempt has been made throughout this report to refer to all stations in terms of their four-digit codes.

TABLE 4.2-1

COMPUTER CODE AND STATION I.D. CROSS-REFERENCE

I Air Quality & Meteorology

	Station Designation	Computer Code
Met. Tower:	@ Sta. 023	AA23
Trailers:	020	AB20
	021	AB21
	022	AB22
	023	AB23
	024	AB24
Acoustic Radar	Sta. 020	AC20
	021	AC21
	023	AC23
MRI and Particulates	Sta. 031	AD31
	032	AD32
	033	AD33
	041	AD41
	042	AD42
	043	AD43
	044	AD44
	056	AD56

II Biology

Program	General Location	Computer Code	*Analysis Code
Deer Days Use	Between Hunter Cr. & Jimmy Gulch	BA01	PJ-CH-C
		BA02	PJ-CH-C
		BA03	PJ-CH-C
		BA04	PJ-CH-C
		BA05	PJ-CH-C
		BA06	PJ-CH-C
		BA07	PJ-CH-C
		BA08	PJ-CH-C
		BA09	PJ-CH-C
	North Side, Piceance Creek	BA10	PJ -D
		BA11	PJ -D
		BA12	PJ -D
		BA13	PJ -C
		BA14	PJ -C
		BA15	PJ -C
	South Side, Piceance Creek	BA16	PJ -D
	On Tract Between Cottonwood & Scandard	BA17	PJ-CH-C
		BA18	PJ-CH-C
		BA19	PJ -C
	On Tract Between Cottonwood & Sorghum	BA20	PJ-CH-D
		BA21	PJ-CH-D
		BA22	PJ -D
	On Tract Between Sorgnum & W. Fork Stewart	BA23	PJ-CH-D
		BA24	PJ
		BA25	PJ-CH-C
	On Tract Between W. &. M. Fork Stewart	BA26	PJ -C
		BA27	PJ -C
	On Tract Between Willow & Scandard North End	BA28	PJ-CH-C
	On Tract Between Willow & Scandard S.E.	BA29	PJ-CH-C
	On Tract Between Cottonwood & Sorghum North	BA30	PJ-CH-C
	On Tract Between Cottonwood & Sorghum South	BA31	PJ-CH-C

*ANALYSIS CODES:

PJ-CH-C	Pinyon Juniper, Chained, Control Station	(12)
PJ -C	Pinyon Juniper, Control Station	(6)
PJ-CH-D	Pinyon Juniper, Chained, Development Station	(3)
PJ -D	Pinyon Juniper, Development Station	(5)

TABLE 4.2-1 (Cont.)

Biology (Cont'd)

Programs: Deer Distribution & Migration and Road Kills

[illegible] Marker	Location	Computer Code	
		North & East of Piceance Creek Road	Meadows; South & West of Piceance Creek Road
41	White River City	BN41	BM41
40	Piceance Bridge	BN40	BM40
39	Lower Canyon	BN39	BM39
38	Piceance Canyon	BN38	BM38
37	Yellow Creek	BN37	BM37
36	Stinking Springs	BN36	BM36
35	Old Bridge	BN35	BM35
34	Little Hills Turnoff	BN34	BM34
33	Old Corrals & Buildings	BN33	BM33
32	Burk Ranch	BN32	BM32
31	Ranch	BN31	BM31
30		BN30	BM30
29		BN29	BM29
28	Bureau of Mines	BN28	BM28
27	Ryan Gulch	BN27	BM27
26	Pump Station	BN26	BM26
25		BN25	BM25
24	Rock School	BN24	BM24
23	AQ 021	BN23	BM23
22	Pat Johnson's Ranch	BN22	BM22
21	Hunter Creek	BN21	BM21
20	PL Gate	BN20	BM20
19	AQ 020	BN19	BM19
18	Sorghum, Cottonwood	BN18	BM18
17	Stewart Gulch Rd.	BN17	BM17
16	AQ Trailer 022	BN16	BM16
15	Oldland's Ranch	BN15	BM15
14	Oldland's Ranch	BN14	BM14
13	Pond and Cabin	BN13	BM13
12	Sprague Gulch	BN12	BM12
11	Cascade Gulch	BN11	BM11
10	13 Mile Gulch	BN10	BM10
9	14 Mile Gulch	BN09	BM09
8	Schutte Gulch	BN08	BM08
7	Robinson's Ranch	BN07	BM07
6		BN06	BM06
5	2 Old Cabins (35 MPH Curve)	BN05	BM05
4	McCarthy Gulch	BN04	BM04
3	Cow Creek	BN03	BM03
2	Mahogany Outcropping	BN02	BM02
1	Woodward Ranch	BN01	BM01
0	Rio Blanco Store	BN00	BM00

TABLE 4.2-1 (Cont.)

Biology (Cont'd)

Programs	General Location	Computer Code		
Deer Mortality	North Side of Piceance Creek	BD01		
		BD02		
		BD03		
		BD04		
		BD05		
		BD06		
	South Side of Piceance Creek	BD07		
		BD08		
		BD09		
		BD10		
Deer Age Class	General Area of Tract	BE01		
Coyotte Abundance	8 Transects for Total for 30 miles	BF01		
	15 mi seg. near Hunter (Control)	BF02 thru BF08		
	15 mi seg. on & South of Tract (Development)			
Lagomorph Abundance	Identical Locations to deer use days	BA01 to BA31		
Small Mammals	Piceance Creek (Development)	BG01		
	On-Tract-west	BG02		
	Piceance Creek (Control)	BG03		
	On-Tract-east	BG04		
	Sprinkler Area Section B	BG05		
Avifauna Songbirds and Gamebirds	N.W. of Tract-near Jimmy PJ-CH-C	BH01		
	On-Tract-Scandard PJ- -D	BH02		
	On-Tract-Cottonwood PJ-CH-D	BH03		
	S. of Tract-Between W&N Fork Stewart PJ- C	BH04		
Raptors	The entire Tract and surrounding study areas.	BI01		
Aquatic Ecology Benthos	USGS 09306007 (Control)	WU07		
	USGS 09306058 (Development)	WU58		
	USGS 09306061 (Development)	WU61		
Periphyton	Piceance Creek Upstream (Control)	WP01		
		WP02		
	Piceance Creek Downstream (Development)	WP03		
Water Quality	USGS 09306061 (Development)	WU61		
Vegetation Community Structure	Plots	*	**	***
	Chained pinyon juniper (1978)(Dev)	BJ01	BJ11	BJ21
	Chained pinyon juniper (1978)(Cont)	BJ02	BJ12	BJ22
	Upland sagebrush (1980)(Cont)	BJ03	BJ13	BJ23
	Bottomland sagebrush (1980)(Cont)	BJ04	BJ14	BJ24
	Pinyon juniper woodland (1979)(Dev)	BJ05	BJ15	BJ25
	Pinyon juniper woodland (1979)(Cont)	BJ06	BJ16	BJ26
Herb Productivity and Utilization	Identical locations to community structure	BJ01 thru BJ26		
	Plus			
	60 range cages in random locations	BK01 thru BK60		
	10 cages on S. facing PJ for baseline	BK61 thru BK70		
	20 cages for fertilization assessment	BK71 thru BK90		
Shrub Productivity and Utilization	Same stations as Deer Days Use Study	BA01 thru BA31		
General Condition	By aircraft over entire Tract area	Not in computer		

* Fenced (3')
** Open

TABLE 4.2-1 (Cont.)

Biology (Cont'd)

Program	General Location	Computer Code
Micro Climate	MC Sta. 1	BC01
	2	BC02
	3	BC03
	4	BC04
	5	BC05
	6	BC06
	7	BC07
	8	BC08
	9	BC09
	13	BC13
Traffic Count	Rio Blanco Store	BT01
	Cattle Guard	BT02
	Rio Blanco Lake	BT03

III Noise

	Station Designation	Computer Code
Traffic Noise	Sta. II	NA02
	IX	NA09
	XV	NB15

IV Photography

P1	PA01
P2	PA02
P3	PA03
P4	PA04
P5	PA05
P6	PA06
P7	PA07
P8	PA08
P9	PA09
P10	PA10
P11	PA11
P12	PA12
P13	PA13
P14	PA14
P15	PA15
P16	PA16
P17	PA17
P18	PA18
P19	PA19
P20	PA20
P21	PA21
P22	PA22
P23	PA23
P24	PA24
P25	PA25
P26	PA26
P27	PA27
P28	PA28
P29	PA29
P30	PA30
P31	PA31
P32	PA32
P33	PA33
P34	PA34
P35	PA35

TABLE 4.2-1 (Cont.)

V. Water

Program	Station Designation	Computer Code
U.S.G.S. Stream Gauging Station	09304800	WU48
	09306007	WU07
	09306036	WU36
	09306039	WU39
	09306042	WU42
	09306061	WU61
	09306050	WU50
	09306052	WU52
	09306058	WU58
	09306033	WU33
	09306025	WU25
	09306015	WU15
	09306028	WU28
	09306022	WU22
	09306200	WU00
	09306222	WU62
	09306255	WU55
Alluvial Wells	A-1	WA01
	A-2	WA02
	A-3	WA03
	A-4	WA04
	A-5	WA05
	A-5A	WA55
	A-6	WA06
	A-7	WA07
	A-8	WA08
	A-9	WA09
	A-10	WA10
	A-11	WA11
	A-12	WA12
	A-13	WA13
Springs and Seeps	CB S-1	WS01
	CB S-2	WS02
	CB S-3	WS03
	CB S-4	WS04
	CB S-6	WS06
	CB S-7	WS07
	CB S-8	WS08
	CB S-9	WS09
	CB S-10 (W-3)	WS10 (WS34)
	CB Seep A	WS11
	CER-1	WS21
	B-3	WS22
	H-3	WS23
	F-3	WS24
	Figure 4-A	WS25
	W-4	WS26
	W-9	WS27
	CER-7	WS28
	S-9	WS29
	P3 & P3A	WS30
	CER-6	WS31
	W-2 (S-9)	WS32
	S-2	WW33
	W-3 (CB S-10)	WS34 (WS10)
	Figure 4	WS35
	S-11 (S-101)	WS36
Precipitation	CB-020	AB20
	CB-023	AB23
	LH	WR01
	M	WR02
	SG	WR03
	CG	WR04
	JQS	WR05
	[illegible]	[illegible]

TABLE 4.2-1 (Cont.)

V. Water (cont'd)

Upper Aquifer Wells

Before Recompletions		After Recompletions	
Station	Code	Station	Code
CB-2	WX02		
CB-4	WX04		
SG-10A	WX10	SG-10A-1	WE10
SG-1A	WX11	SG-10A-2	WD10
SG-1-2	WX12		
SG-17-2	WX17		
SG-18A	WX18		
SG-19	WX19		
SG-20	WX20		
SG-21	WX21		
AT-1C-3	WX44		
SG-11-3	WX55		
SG-6-3	WX63		
SG-8-2	WX82		
SG-9-2	WX92		
32X-12	WX32		
33X-1	WX33		
41X-1	WX41		
TH75-5A	WX64		
TH75-13A	WX65		
TH75-18A	WX67		
TH75-9A	WX69		
CER RB-D-02	WX71		
TH75-15A	WX72		
UNION 8-1	WX73		
COLONY 12-596	WX74		
TH-5	WX75		

Lower Aquifer Wells

Before Recompletions		After Recompletions	
Station	Code	Station	Code
CB-1	WY01		
CB-3	WY03		
SG-10	WY09	SG-10R	WG10
SG-1-1	WY12		
SG-17-1	WY18	SG-17-1R	WY17
AT-1C-1	WY45		
AT-1C-2	WY46		
SG-11-1	WY51	SG-11-1R	WY52
SG-11-2	WY54		
SG-6-1	WY61		
SG-6-2	WY62		
SG-8	WY80	SG-8R	WY81
SG-9-1	WY91		
AT-1	WY44		
TH75-5B	WY64		
TH75-13B	WY65		
EQUITY-1	WY66		
TH75-18B	WY67		
TH75-10B	WY68		
TH75-9B	WY69		
EQUITY-SULFUR-1A	WY70		
CER RB-D-03	WY71		
TH75-15B	WY72		
TG71-3	WY75		
TG71-5	WY76		
GETTY 9-40	WY77		
TG71-4	WY78		
EQUITY BS-13	WY79		

TABLE 4.2-1 (Cont.)

V. Water (cont'd)

	Station	Code
Composite Wells:		
	GREENO 404	WV01
	OLDLAND 3	WV02
	GP-17X-BG	WV03
	BUTE 25	WV04
	LIBERTY BELL 12	WV05
Seepage Monitoring Wells:		
	31X-12	WW12
	41X-13-2	WW13
Ponds:		
	POND A	WN01
	POND B	WN02
	POND C	WN03
	POND A SPRINGS	WN11
	POND B SPRINGS	WN12
	POND C SPRINGS	WN13
	POND A INLET	WN21
	POND B INLET	WN22
	POND C INLET	WN23
	POND A-B CROSSOVER	WN31
	POND B OUTLET	WN32
	POND C OUTLET	WN33
	BACKWASH POND	WN04
	BACKWASH POND SPRINGS	WN14
	BACKWASH POND INLET	WN24
	BACKWASH POND OUTLET	WN34
	POND A-B DISCHARGE	WN40
Shafts:		
	V/E SHAFT PROBE HOLES	WZ01
	SERVICE SHAFT PROBE HOLES	WZ02
	PRODUCTION SHAFT PROBE HOLES	WZ03
	V/E SHAFT WATER RING	WZ11
	SERVICE SHAFT WATER RING	WZ12
	PRODUCTION SHAFT WATER RING	WZ13
	V/E SHAFT SUMP	WZ21
	SERVICE SHAFT SUMP	WZ22
	PRODUCTION SHAFT SUMP	WZ23
	V/E SHAFT	WZ31
	PRODUCTION SHAFT	WZ33
	SHAFT GROUT HOLE	WZ41

4.3 Station Coordinates

Environmental monitoring stations have been specified by station computer code, latitude and longitude, township and range, Colorado State coordinates and elevations for this report period. In cases where stations represent biological transects several meters in length, the coordinates reported are those of a point on the map near the station label. A jacket map of the Tract area (Figure 4.3-1) showing all monitoring stations on and near Tract C-b, required by the Developmental Monitoring Program, are designated by their four-digit computer station codes.

ENVIRONMENTAL DATA COLLECTION STATION COORDINATES

STATION CODE	LATITUDE & LONGITUDE	TOWNSHIP & RANGE	STATE COORDINATES*	ELEVATION
I. AIR QUALITY AND METEOROLOGY				
AA23	39° 47' 43" 108° 12' 57"	T3S R96W Sec 18 NW1/4, NW1/4, NW1/4	N 180,000 E 1,237,045	6950'
AB20	39° 50' 10" 108° 13' 08"	T2S R97W Sec 36 NE1/4, SE1/4, NE1/4	N 194,845 E 1,236,605	6280'
*AB23	39° 47' 44"* 108° 12' 54"	T3S R96W Sec 18 NE1/4, NW1/4, NW1/4	N 180,000 E 1,237,234	6950'
AB24 *	39° 48' 49" 108° 12' 21"	T3S R96W Sec 6 NE1/4, SW1/4, SE1/4	N 186,542 E 1,240,000	6750'
AC20	39° 50' 08" 108° 13' 06"	T2S R97W Sec 36 NE1/4, SE1/4, NE1/4	N 194,594 E 1,236,794	6310'
AD42	39° 48' 58" 108° 13' 08"	T3S R97W Sec 1 SE1/4, NE1/4, SE1/4	N 187,548 E 1,236,417	6720'
AD56* *	39° 49' 31" 108° 12' 23"*	T3S R96W Sec 6 NE1/4, NW1/4, NE1/4	N 190,760 E 1,240,005	6380'
II. BIOLOGY				
*BA01 *	39° 50' 15"* 108° 16' 12"*	T2S R97W Sec 34 SW1/4, NE1/4, NW1/4	N 195,788 E 1,222,268	6480'
*BA02 *	39° 50' 3"* 108° 16' 4"*	T2S R97W Sec 34 SE1/4, SW1/4, NW/14	N 194,594 E 1,222,079	6500'
BA03	39° 49' 32" 108° 16' 5"	T3S R97W Sec 3 NE1/4, NE1/4, NW1/4	N 191,388 E 1,222,708	6640'
BA04	39° 49' 12" 108° 15' 46"	T3S R97W Sec 3 NE1/4, NW1/4, SE1/4	N 189,371 E 1,224,091	6600'
BA05	39° 48' 39" 108° 16' 14"	T3S R97W Sec 3 SW1/4, SE1/4, SW1/4	N 186,039 E 1,221,828	6720'
BA06	39° 48' 19" 108° 16' 19"	T3S R97W Sec 10 SE1/4, SW1/4, NW1/4	N 184,028 E 1,221,388	6780'
BA07	39° 47' 49" 108° 16' 28"	T3S R97W Sec 10 NW1/4, SW1/4, SW1/4	N 181,074 E 1,220,571	6860'
BA08	39° 47' 33" 108° 16' 38"	T3S R97W Sec 16 NE1/4, SE1/4, NE1/4	N 179,497 E 1,218,748	6860'
BA09	39° 47' 9" 108° 16' 49"	T3S R97W Sec 16 SE1/4, NW1/4, SE1/4	N 177,108 E 1,218,805	6940'
BA10	39° 50' 48" 108° 14' 20"	T2S R97W Sec 25 SW1/4, SW1/4, NW1/4	N 198,868 E 1,231,137	6600'
BA11	39° 50' 46" 108° 13' 42"	T2S R97W Sec 25 SE1/4, NE1/4, SW1/4	N 198,554 E 1,234,091	6580'
BA12	39° 50' 29" 108° 13' 8"	T2S R97W Sec 25 SE1/4, SE1/4, SE1/4	N 196,731 E 1,236,668	6600'
BA13	39° 49' 52" 108° 12' 5"	T2S R96W Sec 31 SE1/4, NE1/4, SE1/4	N 192,834 E 1,241,451	6600'

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* Plane Coordinate Projection Tables, Colorado, Special Publication No. 276, U.S. Government Printing Office.

ENVIRONMENTAL DATA COLLECTION STATION COORDINATES

STATION CODE	LATITUDE & LONGITUDE	TOWNSHIP & RANGE	STATE COORDINATES*	ELEVATION
BA14	39° 49' 52" 108° 10' 55"	T2S R96W Sec 33 SW1/4, NW1/4, SW1/4	N 192,645 E 1,246,920	6700'
BA15	39° 49' 46" 108° 10' 30"	T2S R96W Sec 33 NW1/4, SE1/4, SW1/4	N 192,079 E 1,248,868	6600'
BA16	39° 49' 56" 108° 14' 9"	T2S R97W Sec 36 NW1/4, NW1/4, SW1/4	N 193,525 E 1,231,828	6500'
BA17	39° 48' 32" 108° 14' 38"	T3S R97W Sec 11 SW1/4, NW1/4, NE1/4	N 185,097 E 1,229,308	6680'
BA18	39° 47' 49" 108° 14' 25"	T3S R97W Sec 14 NW1/4, NE1/4, NE1/4	N 180,760 E 1,230,131	6820'
BA19	39° 47' 56" 108° 14' 2"	T3S R97W Sec 12 NE1/4, SW1/4, SW1/4	N 181,451 E 1,232,017	6680'
BA20	39° 48' 0" 108° 12' 32"	T3S R96W Sec 7 SE1/4, SE1/4, NW1/4	N 182,142 E 1,238,554	6860'
BA21	39° 4' 6" 108° 12' 33"	T3S R96W Sec 7 NE1/4, SE1/4, SW1/4	N 181,640 E 1,239,057	6820'
BA22	39° 47' 4" 108° 12' 5"	T3S R96W Sec 18 SE1/4, NE1/4, SW1/4	N 176,165 E 1,238,742	6860'
BA23	39° 48' 51" 108° 12'	T3S R96W Sec 7 NE1/4, SE1/4, SE1/4	N 181,954 E 1,241,137	6840'
BA24	39° 48' 51" 108° 11' 51"	T3S R96W Sec 5 NE1/4, SW1/4, SW1/4	N 186,668 E 1,242,398	6640'
BA25	39° 47' 16" 108° 11' 46"	T3S, R96W Sec 17 NW1/4, NE1/4, SW1/4	N 177,045 E 1,242,457	7000'
BA26	39° 48' 8" 108° 10' 52"	T3S, R96W Sec 9 NW1/4, NW1/4, SW1/4	N 182,142 E 1,246,857	6840'
BA27	39° 47' 4" 108° 11' 13"	T3S R96W Sec 16 NW1/4, SW1/4, SW1/4	N 175,725 E 1,245,034	7020'
BA28	39° 48' 28" 108° 14' 29"	T3S R97W Sec 11 SE1/4, NW1/4, NE1/4	N 184,657 E 1,230,000	6680'
BA29a	39° 47' 43" 108° 14' 16"	T3S R97W Sec 14 NE1/4, NE1/4, NE1/4	N 180,068 E 1,230,885	6860'
BA29b	39° 47' 38" 108° 14' 23"	T3S R97W Sec 14 SW1/4, NE1/4, NE1/4	N 179,622 E 1,230,320	6900'
BA30	39° 48' 49" 108° 12' 35"	T3S R96W Sec 6 NE1/4, SE1/4, SW1/4	N 186,542 E 1,238,931	6720'
BA31	39° 48' 23" 108° 12' 40"	T3S R96W Sec 7 NE1/4, SE1/4, NW1/4	N 183,965 E 1,238,491	6820'
BC01	39° 47' 56" 108° 11' 58"	T3S R97W Sec 8 NW1/4, SW1/4, SW1/4	N 181,137 E 1,241,640	6860'
BC02	39° 47' 48" 108° 14' 22"	T3S R97W Sec 11 SW1/4, SE1/4, SE1/4	N 180,634 E 1,230,382	6860'

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ENVIRONMENTAL DATA COLLECTION STATION COORDINATES

STATION CODE	LATITUDE & LONGITUDE	TOWNSHIP & RANGE	STATE COORDINATES*	ELEVATION
BC03	39° 46' 57" 108° 12' 1"	T3S R96W Sec 17 SW1/4 SW1/4, SW1/4	N 175,097 E 1,241,262	7100'
BC04	39° 47' 28" 108° 13' 32"	T3S R97W Sec 13 NW1/4, SW1/4, NE1/4	N 178,491 E 1,234,217	6700'
BC05	39° 48' 3" 108° 11' 58"	T3S R96W Sec 8 SE1/4, NW1/4, SW1/4	N 181,765 E 1,241,702	6840'
BC06	39° 47' 54" 108° 10' 44"	T3S R96W Sec 9 SE1/4, SW1/4, SW1/4	N 180,697 E 1,247,422	6900'
BC07	39° 47' 44" 108° 13' 17"	T3S R97W Sec 13 NW1/4, NE1/4, NE1/4	N 180,068 E 1,235,474	6940'
BC08	39° 50' 30" 108° 13' 36"	T2S R97W Sec 25 NW1/4, SW1/4, SW1/4	N 196,920 E 1,234,468	6350'
BC09	39° 49' 30" 108° 11' 53"	T3S R96W Sec 5 NE1/4, NW1/4, NW1/4	N 190,634 E 1,242,331	6400'
BC13	39° 47' 19" 108° 11' 20"	T3S R96W Sec 17 NE1/4, NW1/4, SE1/4	N 177,234 E 1,244,531	6700'
BD01	39° 50' 59" 108° 14' 26"	T2S R97W Sec 26 SE1/4, SE1/4, NE1/4	N 200,000 E 1,230,697	6380'
BD02	39° 50' 44" 108° 13' 55"	T2S R97W Sec 25 NW1/4, NE1/4, SW1/4	N 198,428 E 1,233,022	6370'
BD03	39° 50' 34" 108° 12' 57"	T2S R96W Sec 30 SW1/4, SW1/4, SW1/4	N 197,171 E 1,237,548	6420'
BD04	39° 50' 3" 108° 12' 19"	T2S R96W Sec 31 SW1/4, SE1/4, NE1/4	N 194,028 E 1,240,445	6420'
BD05	39° 50' 9" 108° 11' 41"	T2S R96W Sec 32 NW1/4, SE1/4,NW1/4	N 194,468 E 1,243,400	6420'
BD06	39° 49' 46" 108° 10' 34"	T2S R96W Sec 33 NW1/4, SE1/4, SW1/4	N 192,017 E 1,248,554	6500'
BD07	39° 49' 51" 108° 13' 16"	T2S R97W Sec 36 SW1/4, NE1/4, SE1/4	N 192,897 E 1,235,914	6380'
BD08	39° 49' 46" 108° 12' 43"	T2S R96W Sec 31 NW1/4, SE1/4, SW1/4	N 192,394 E 1,238,491	6360'
BD09	39° 49' 26" 108° 12' 28"	T3S R96W Sec 6 SW1/4, NW1/4, NE1/4	N 190,257 E 1,239,559	6410'
BD10	39° 49' 17" 108° 11' 49"	T3S R96W Sec 5 NE1/4, SW1/4, NW1/4	N 189,245 E 1,242,582	6420'
Coordinates Picked Near Transect Map Code Level				
BF01	39° 47' 53" 108° 16' 35"	T3S R97W Sec 9 NE1/4, SE1/4, SE1/4	N 181,514 E 1,220,068	6900'
BF02	39° 48' 02" 108° 14' 27"	T3S R97W Sec 11 SW1/4, NE1/4, SE1/4	N 182,017 E 1,230,068	6800'
BF03	39° 46' 40" 108° 13' 32"	T3S R97W Sec 24 NW1/4, SW1/4, NE1/4	N 173,651 E 1,234,091	6860'

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ENVIRONMENTAL DATA COLLECTION STATION COORDINATES

STATION CODE	LATITUDE & LONGITUDE	TOWNSHIP & RANGE	STATE COORDINATES*	ELEVATION
BF04	39° 46' 25" 108° 13' 04"	T3S R97W Sec 24 NE1/4, NE1/4, SE1/4	N 172,017 E 1,236,228	7190'
BF05	39° 47' 30" 108° 12' 9"	T3S R96W Sec 18 NE1/4, SE1/4, NE1/4	N 178,491 E 1,240,697	6980'
BF06	39° 47' 44" 108° 11' 43"	T3S R96W Sec 17 NW1/4, NE1/4, NW1/4	N 179,874 E 1,242,771	6940'
BF07	39° 46' 09" 108° 11' 49"	T3S R96W Sec 20 SW1/4, SE1/4, SW1/4	N 170,257 E 1,242,017	6820'
BF08	39° 47' 31" 108° 11' 9"	T3S R96W Sec 16 NE1/4, SW1/4, NW1/4	N 178,491 E 1,245,411	6950'
BG01	39° 50' 17" 108° 13' 58"	T2S R97W Sec 36 SW1/4, NE1/4, NW1/4	N 195,662 E 1,232,708	6360'
BG02	39° 47' 46" 108° 13' 23"	T3S R97W Sec 13 NE1/4, NW1/4, NE1/4	N 180,320 E 1,234,971	6940'
BG03	39° 49' 39" 108° 12' 10"	T2S R96W Sec 31 SE1/4, SE1/4, SE1/4	N 191,577 E 1,241,011	6300'
BG04	39° 47' 40" 108° 10' 55"	T3S R96W Sec 16 SW1/4, NW1/4, NW1/4	N 179,371 E 1,246,542	6860'
BH01	39° 48' 46" 108° 15' 59"	T3S R97W Sec 5 SE1/4, SE1/4, SW1/4	N 186,731 E 1,223,022	6660'
BH02	39° 47' 59" 108° 13' 38"	T3S R97W Sec 12 SW1/4, SW1/4, SE1/4	N 181,640 E 1,233,902	6780'
BH03	39° 48' 14" 108° 13' 1"	T3S R96W Sec 7 SW1/4, NW1/4, SW1/4	N 183,085 E 1,236,794	6840'
BH04	39° 46' 48" 108° 10' 56"	T3S R96W Sec 20 NE1/4, SE1/4, NE1/4	N 174,091 E 1,246,291	7120'
BJ01	39° 47' 56" 108° 11' 58"	T3S R96W Sec 8 NW1/4, SW1/4, SW1/4	N 181,137 E 1,241,640	6860'
BJ02	39° 47' 43" 108° 14' 23"	T3S R97W Sec 14 NW1/4, NE1/4, NE1/4	N 180,194 E 1,230,320	6870'
BJ03	39° 46' 58" 108° 12' 3"	T3S R96W Sec 17 SW1/4, SW1/4, SW1/4	N 175,285 E 1,241,074	7100'
BJ04	39° 47' 24" 108° 13' 30"	T3S R97W Sec 13 SE1/4, SW1/4, NE1/4	N 178,114 E 1,234,405	6700'
BJ05	39° 48' 08" 108° 11' 54"	T3S R96W Sec 8 SE1/4, NW1/4, SW1/4	N 182,268 E 1,242,017	6840'
BJ06	39° 47' 53" 108° 10' 42"	T3S R96W Sec 9 SE1/4, SW1/4, SW1/4	N 180,634 E 1,247,611	6880'

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ENVIRONMENTAL DATA COLLECTION STATION COORDINATES

STATION CODE	LATITUDE & LONGITUDE	TOWNSHIP & RANGE	STATE COORDINATES*	ELEVATION
III. NOISE				
NA02	39° 50' 43" 108° 14' 19"	T2S R97W Sec 25 SW1/4, NW1/4, SW1/4	N 198,302 E 1,231,200	6520'
NA09	39° 49' 08" 108' 14' 17"	T3S R97W Sec 2 SE1/4, SE1/4, NE1/4	N 188,679 E 1,231,074	6660'
NB15	39° 49' 04" 108° 13' 26"	T3S R97W Sec 1 NE/14, NW1/4, SE1/4	N 188,177 E 1,234,971	6720'
IV. PHOTOGRAPHY				
PA01	39° 51' 50" 108° 11' 23"	T2S R96W Sec 20 SW1/4, SW1/4, NE1/4	N 204,714 E 1,245,097	7420'
PA02	39° 50' 44" 108° 14' 5"	T2S R97W Sec 25 SE1/4, NW1/4, SW1/4	N 198,365 E 1,232,268	6560'
PA03	39° 50' 23" 108° 14' 7"	T2S R97W Sec 36 NE1/4, NW1/4, NW1/4	N 196,291 E 1,232,079	6300'
PA04	39° 49' 58" 108° 13' 11"	T2S R97W Sec 26 NE/14, NE1/4, SE1/4	N 193,651 E 1,236,354	6410'
PA05	39° 49' 03" 108° 14' 41"	T3S R97W Sec 2 NW1/4, NW1/4, SE1/4	N 188,239 E 1,229,119	6410'
PA06	39° 48' 55" 108° 14' 5"	T3S R97W Sec 1 SW1/4, NW1/4, SW1/4	N 187,422 E 1,231,954	6770'
PA07	39° 48' 55" 108° 13' 57"	T3S R97W Sec 1 SE1/4, NW1/4, SW1/4	N 187,359 E 1,232,582	6770'
PA08	39° 49' 18" 108° 13' 49"	T3S R97W Sec 1 NW1/4, SE1/4, NW1/4	N 189,685 E 1,233,274	6760'
PA09	39° 48' 53" 108° 12' 20"	T3S R96W Sec 6 NE1/4, SW1/4, SE1/4	N 186,920 E 1,240,131	6750'
PA10	39° 49' 30" 108° 11' 50"	T3S R96W Sec 5 NE1/4, NW1/4, NW1/4	N 190,634 E 1,242,582	6430'
PA11	39° 48' 41" 108° 11' 47"	T3S R96W Sec 5 SW1/4, SE1/4, SW1/4	N 185,662 E 1,242,645	6700'
PA12	39° 48' 47" 108° 11' 28"	T3S R96W Sec 5 SW1/4, SW1/4, SE1/4	N 186,228 E 1,244,154	6740'
PA13	39° 49' 33" 108° 11' 44"	T2S R96W Sec 32 SE1/4, SW1/4, SE1/4	N 190,885 E 1,243,085	6500'
PA14	39° 48' 22" 108° 14' 29"	T3S R97W Sec 11 NE1/4, SW1/4, NE1/4	N 184,091 E 1,229,937	6700'
PA15	39° 48' 21" 108° 14' 3"	T3S R97W Sec 12 NE1/4, SW1/4, NW1/4	N 183,902 E 1,232,017	6670'
PA16	39° 47' 56" 108° 13' 49"	T3S R97W Sec 12 NE1/4, SE1/4, SW1/4	N 181,325 E 1,233,022	6730'

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ENVIRONMENTAL DATA COLLECTION STATION COORDINATES

STATION CODE	LATITUDE & LONGITUDE	TOWNSHIP & RANGE	STATE COORDINATES*	ELEVATION
PA17	39° 48' 35" 108° 13' 19"	T3S R97W Sec 12 NW1/4, NE1/4, NE1/4	N 185,285 E 1,235,474	6760'
PA18	39° 48' 31" 108° 13' 10"	T3S R97W Sec 12 SW1/4, NE1/4, NE1/4	N 184,782 E 1,236,165	6820'
PA19	39° 47' 50" 108° 12' 57"	T3S R96W Sec 7 SW1/4, SW1/4, SW1/4	N 180,697 E 1,237,045	6870'
PA20	39° 48' 4" 108° 12' 47"	T3S R96W Sec 7 SW1/4, NE1/4, SW1/4	N 182,017 E 1,237,862	6890'
PA21	39° 47' 46" 108° 12' 5"	T3S R96W Sec 18 NE1/4, NE1/4, NE1/4	N 180,068 E 1,241,074	6920'
PA22	39° 48' 16" 108° 11' 34"	T3S R96W Sec 8 SE1/4, SE1/4, NW1/4	N 183,085 E 1,243,588	6860'
PA23	39° 48' 38" 108° 10' 57"	T3S R96W Sec 8 NE1/4, NE1/4, NE1/4	E 185,222 E 1,246,542	6540'
PA24	39° 47' 57" 108° 10' 44"	T3S R96W Sec 9 NE1/4, SW1/4, SW1/4	N 181,074 E 1,247,422	6880'
PA25	39° 48' 10" 108° 10' 24"	T3S R96W Sec 9 NE1/4, NE1/4, SW1/4	N 182,268 E 1,248,994	6520'
PA26	39° 47' 25" 108° 13' 39"	T3S R97W Sec 13 SE1/4, SE1/4, NW1/4	N 178,239 E 1,233,714	6770'
PA27	39° 47' 22" 108° 12' 58"	T3S R96W Sec 18 SW1/4, SW1/4, NW1/4	N 177,862 E 1,236,857	6980'
PA28	39° 47' 8" 108° 12' 58"	T3S R96W Sec 18 NW1/4, SW1/4, SW1/4	N 176,417 E 1,236,794	7010'
PA29	39° 46' 57" 108° 11' 20"	T3S R96W Sec 17 SW1/4, SW1/4, SE1/4	N 175,034 E 1,244,405	6700'
PA30	39° 46' 58" 108° 10' 48"	T3S R96W Sec 16 SW1/4, SW1/4, SW1/4	N 175,034 E 1,246,920	7120'
PA31	39° 47' 46" 108° 10' 45"	T3S R96W Sec 16 NE1/4, NW1/4, NW1/4	N 179,874 E 1,247,359	6920'
PA32	39° 47' 25" 108° 10' 18"	T3S R96W Sec 16 SW1/4, SW1/4, NE1/4	N 177,737 E 1,249,371	6640'
PA33	39° 46' 58" 108° 13' 00"	T3S R96W Sec 18 SW1/4, SW1/4, SW1/4	N 175,411 E 1,236,605	7060'
PA34	39° 46' 53" 108° 12' 5"	T3S R96W Sec 19 NE1/4, NE1/4, NE1/4	N 174,720 E 1,240,948	7120'
PA35	39° 45' 21" 108° 13' 6"	T3S R97W Sec 25 NE1/4, SE1/4, SE1/4	N 165,537 E 1,235,851	7400'
V. WATER				
WA01	39° 50' 31" 108° 13' 54"	T2S R97W Sec 25 SW1/4, SE1/4, SW1/4	N 197,108 E 1,233,085	6300'

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* *Plane Coordinate Projection Tables, Colorado*, Special Publication No. 276, U. S. Government Printing Office.

ENVIRONMENTAL DATA COLLECTION STATION COORDINATES

STATION CODE	LATITUDE & LONGITUDE	TOWNSHIP & RANGE	STATE COORDINATES*	ELEVATION
WA02	39° 50' 10" 108° 14' 37"	T2S R97W Sec 35 NE1/4, SW1/4, NE1/4	N 195,034 E 1,229,685	6280'
WA03	39° 48' 48" 108° 14' 32"	T3S R97W Sec 2 NE1/4, SW1/4, SE1/4	N 186,731 E 1,229,811	6460'
WA04	39° 47' 26" 108° 13' 35"	T3S R97W Sec 13 SW1/4, SW1/4, NE1/4	N 178,302 E 1,234,028	6700'
WA05	39° 50' 4" 108° 13' 14"	T2S R97W Sec 36 SW1/4, SE/14, NE1/4	N 194,217 E 1,236,102	6330'
WA06	39° 49' 36" 108° 12' 25"	T2S R96W Sec 31 SE1/4, SW1/4, SE1/4	N 191,262 E 1,239,874	6360'
WA07	39° 49' 31" 108° 11' 59"	T3S R96W Sec 5 NW1/4, NW1/4, NW1/4	N 190,697 E 1,241,891	6370'
WA08	39° 49' 12" 108° 11' 8"	T3S R96W Sec 5 SW1/4, SE1/4, NE1/4	N 188,679 E 1,245,788	6400'
WA09	39° 48' 10" 108° 10' 22"	T3S R96W Sec 9 NE1/4, NE1/4, SW1/4	N 182,268 E 1,249,182	6420'
WA10	39° 47' 25" 108° 10' 24"	T3S R96W Sec 16 SE1/4, SE1/4, NW1/4	N 177,800 E 1,248,931	6580'
WA11	39° 48' 18" 108° 11' 7"	T3S R96W Sec 8 SW1/4, SE1/4, NE1/4	N 183,211 E 1,245,725	6550'
WA12	39° 46' 58" 108° 11' 25"	T3S R96W Sec 17 SW1/4, SW1/4, SE/14	N 175,159 E 1,244,028	6700'
WA13	39° 47' 13" 108° 12' 34"	T3S R96W Sec 18 SW1/4, NW1/4, SE1/4	N 176,857 E 1,238,679	6840'
WP01	39° 49' 35" 108° 11' 2"	T2S R96W Sec 32 SE1/4, SE1/4, SE1/4	N 190,948 E 1,246,291	6380'
WP02	39° 49' 41" 108° 12' 2"	T2S R96W Sec 32 NW1/4, SW1/4, SW1/4	N 1,191,702 E 1,241,702	6300'
WP03	39° 51' 03" 108° 15' 27"	T2S R97W Sec 26 NW1/4, SW1/4, NW1/4	N 200,502 E 1,225,977	6220'
WS01	39° 49' 30" 108° 11' 2"	T3S R96W Sec 5 NE1/4, NE1/4, NE1/4	N 190,445 E 1,246,291	6380'
WS02	39° 48' 3" 108° 10' 16"	T3S R96W Sec 9 SW1/4, NW1/4, SE1/4	N 181,577 E 1,249,622	6540'
WS03	39° 49' 1" 108° 11' 9"	T3S R96W Sec 5 NW1/4, NE1/4, NE1/4	N 190,634 E 1,245,788	6360'
WS04	39° 48' 1" 108° 10' 13"	T3S R96W Sec 9 NE1/4, SW1/4, SE1/4	N 181,388 E 1,249,874	6550'
WS06	39° 50' 23" 108° 14' 38"	T2S R97W Sec 35 NE1/4, NW1/4, NE1/4	N 196,354 E 1,229,622	6260'
WS07	39° 50' 17" 108° 14' 33"	T2S R97W Sec 35 SW1/4, NE1/4, NE1/4	N 195,788 E 1,230,000	6280'
WS08	39° 48' 57" 108° 14' 48"	T3S R97W Sec 11 SE1/4, NE1/4, SE1/4	N 187,674 E 1,228,554	6400'

* *Plane Coordinate Projection Tables, Colorado*, Special Publication No. 276, U. S. Government Printing Office.

ENVIRONMENTAL DATA COLLECTION STATION COORDINATES

STATION CODE+	LATITUDE & LONGITUDE	TOWNSHIP & RANGE	STATE COORDINATES*	ELEVATION
WS09	39° 47' 51" 108° 14' 53"	T3S R97W Sec 14 NW1/4, NE1/4, SW1/4	N 181,011 E 1,227,988 27,988	6550' 655
WS10	39° 47' 16" 108° 15' 2"	T3S R97W Sec 2 SE1/4, NE1/4, SW1/4	N 177,485 E 1,227,171	6580'
WU01		T3S R97W Sec 22 E1/4, N1/4, E1/4		
WU02		T3S R97W Sec 8 SE1/4, S1/4, E1/4		
WU07	39° 49' 31" 108° 10' 59"	T3S R96W Sec 5 NE1/4, NE1/4, NE1/4	N 190,634 E 1,246,542	6400'
WU15	39° 47' 20" 108° 10' 23"	T3S R96W Sec 16 NE1/4, NE1/4, SW1/4	N 177,234 E 1,248,931	6600'
WU22	39° 48' 45" 108° 10' 60"	T3S R96W Sec 5 SE1/4, SE1/4, SE1/4	N 185,914 E 1,246,354	6460'
WU25	39° 46' 57" 108° 11' 21"	T3S R96W Sec 17 SE1/4, SW1/4, SE1/4	N 175,097 E 1,244,342	6680'
WU28	39° 48' 42" 108° 11' 0	T3S R96W Sec 5 SE1/4, SE1/4, SE1/4	N 185,662 E 1,246,291	6460'
WU33	39° 47' 15" 108° 12' 34"	T3S R96W Sec 18 SE1/4, NE1/4, SW1/4	N 177,045 E 1,238,742	6860'
WU36	39° 49' 28" 108° 11' 54"	T3S R96W Sec 5 NE1/4, NW1/4, NW1/4	N 190,382 E 1,242,268	6380'
WU39	39° 49' 34" 108° 12' 27"	T2S R96W Sec 31 SW1/4, SW1/4, SE1/4	N 191,137 E 1,239,685	6380'
WU42	39° 50' 3" 108° 13' 13"	T2S R97W Sec 36 SE1/4, SE1/4, NE1/4	N 194,091 E 1,236,228	6430'
WU50	39° 47' 43" 108° 13' 39"	T3S R97W Sec 13 NE1/4, NE1/4, NW1/4	N 180,000 E 1,233,714	6660'
WU52	39° 48' 49" 108° 14' 34"	T3S R97W Sec 2 NE1/4, SW1/4, SE1/4	N 186,857 E 1,229,685	6460'
WU58	39° 50' 12" 108° 14' 36"	T2S R97W Sec 35 NE1/4, SW1/4, NE1/4	N 195,222 E 1,229,748	6280'
WU61	39° 51' 3" 108° 15' 31"	T2S R97W Sec 27 NE1/4, SE1/4, NE1/4	N 220,502 E 1,225,600	6220'
WW12	39° 48' 42" 108° 13' 29"	T3S R97W Sec 1 SE1/4, SW1/4, SE1/4	N 185,977 E 1,234,720	6780'
WX02	39° 48' 56" 108° 12' 22"	T3S R96W Sec 6 SE1/4, NW1/4, SE1/4	N 187,234 E 1,240,000	6730'
WX03	39° 48' 51" 108° 11' 29"	T3S R96W Sec 5 NW1/4, SW1/4, SE1/4	N 186,605 E 1,244,091	6740'
WX04	39° 47' 11" 108° 12' 4"	T3S R96W Sec 17 SE1/4, NW1/4, SW1/4	N 176,542 E 1,241,074	7040'

* Plane Coordinate Projection Tables, Colorado, Special Publication No. 276, U.S. Government Printing Office.

+ Multiple station codes at the same location indicates samples taken at different depths.

ENVIRONMENTAL DATA COLLECTION STATION COORDINATES

STATION CODE+	LATITUDE & LONGITUDE	TOWNSHIP & RANGE	STATE COORDINATES*	ELEVATION
WX10	39° 47' 46" 108° 13' 06"	T3S R97W Sec 13 NE1/4, NE1/4, NE1/4	N 180,257 E 1,236,291	6950'
WX12/WY12	39° 48' 52" 108° 14' 36"	T3S R97W Sec 2 NE1/4, SW1/4, SE1/4	N 187,171 E 1,229,497	6440'
WX17/WY17	39° 46' 58" 108° 10' 51"	T3S R96W Sec 16 SW1/4, SW1/4, SW1/4	N 175,034 E 1,246,668	7040'
WX19	39° 49' 31" 108° 11' 59"	T3S R96W Sec 5 NW1/4, NW1/4, NW1/4	N 190,760 E 1,241,891	6370'
WX20	39° 49' 33" 108° 12' 24"	T2S R96W Sec 31 SE1/4, SW1/4, SE1/4	N 191,011 E 1,239,937	6350'
WX21	39° 48' 57" 108° 13' 24"	T3S R97W Sec 13 SE1/4, SW1/4, SE1/4	N 175,348 E 1,234,782	6870'
WX32	39° 48' 26" 108° 13' 36"	T3S R97W Sec 12 NW1/4, SW1/4, NE1/4	N 184,342 E 1,234,091	6840'
WX33	39° 49' 0" 108° 13' 28"	T3S R97W Sec 1 SE1/4, NW1/4, SE1/4	N 187,800 E 1,234,845	6720'
WX44/WY45 /WY46	39° 48' 1" 108° 12' 44"	T3S R96W Sec 7 SW1/4, NE1/4, SW1/4	N 181,765 E 1,238,114	6910'
WX55/WY52 /WY54	39° 47' 48" 108° 12' 7"	T3S R96W Sec 7 SE1/4, SE1/4, SE1/4	N 180,320 E 1,240,948	6900'
WX63/WY61 WY62/WY81	39° 48' 13" 108° 12' 32"	T3S R96W Sec 7 NW1/4, NW1/4, SE1/4	N 182,897 E 1,239,057	6870'
WX92/WY91	39° 47' 48" 108° 14' 20"	T3S R97W Sec 11 SE1/4, SE1/4, SE1/4	N 180,634 E 1,230,571	6870'
WY01	39° 48' 52" 108° 14' 3"	T3S R97W Sec 1 NE1/4, SW1/4, SW1/4	N 187,045 E 1,232,079	6780'
WY10	39° 47' 46" 108° 13' 6"	T3S R97W Sec 13 NE1/4, NE1/4, NE1/4	N 180,257 E 1,236,291	6950'
WY81	39° 48' 12" 108° 10' 24"	T3S R96W Sec 9 NE1/4, NE1/4, SW1/4	N 182,457 E 1,249,057	6540'
WZ01	39° 48' 56" 108° 13' 33"	T3S R96W Sec 1 SE1/4, NW1/4, SE1/4	N 187,422 E 1,234,405	6720'

* Plane Coordinate Projection Tables, Colorado, Special Publication No 276, U.S. Govenrment Printing Office.

+ Multiple station codes at the same location indicates samples taken at different depths.

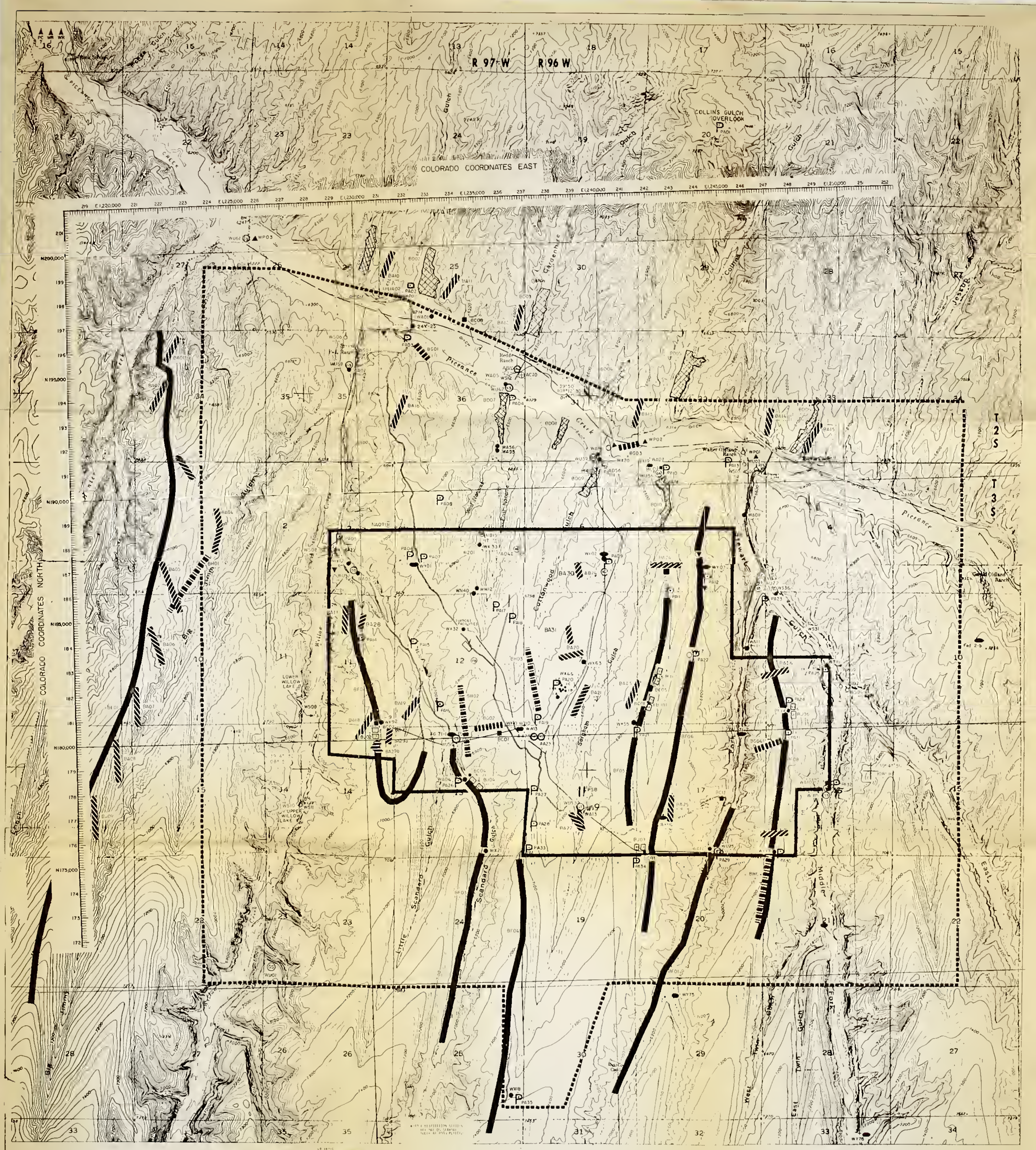

FIGURE 4.3-1

DEVELOPMENT MONITORING ACTIVITIES

REVISION 1 MAR 8, 1979
REVISION 2 JUL 1, 1979
REVISION 3 MAR 14, 1980
REVISION 4 JUN 16, 1980
REVISION 5 JAN 7, 1981

5.0 Special Reports

This section contains the following reports:

Report	Page No.
Shaft Mapping Report, Nick Stellavato June 1, 1980 to July 31, 1980	III-234
Shaft Mapping Report, Nick Stellavato August 1, 1980 to September 30, 1980	III-249

REPORT FOR THE PERIOD

JUNE 1, 1980, TO JULY 31, 1980

Sinking continued in the V/E Shaft to a depth of 5554' where #9 grout cover was started on June 17, 1980, and was completed on July 26, 1980. Sinking continued in the Production Shaft until June 9th when the Upper Void Level Station development East Heading excavation began (Elevation 5486'). In the Service Shaft, the Ignition Level development was completed and sinking to the Upper Void Level began.

The Production Shaft, after probing reported in the April-May Report, sank to the Upper Void Level which is located in the richest oil shale zone, the Mahogany Zone. Development began on the Upper Void Level East Heading top bench, refer to Figure 1 for Upper Void Level layout. Stratigraphically, the Upper Void Level is located in the Mahogany Zone below the A-groove. The Mahogany marker (8" thick tuff bed) is in the station at an Elevation of 5501' (Figure 2). This is the classic "marker bed" throughout the basin used for geologic mapping. As the Upper Void Level is excavated in the Service Shaft, an exact structural dip of beds can be obtained using this marker bed. During fracture mapping in the Upper Void Level, fracture dips changed direction 1' above the marker bed similar to light being refracted through a prism. Fractures observed above the marker were striking N60°-70°W and dipping approximately 60°SW. At a rich oil shale bed 1' above the Mahogany marker, the dip steepened to 80°-90° and changed orientation to the NE, resembling steeper dips observed at the outcrop, i.e., Logan Wash, Colony, and Naval Oil Shale Reserve. If this trend continues, pillars will not be affected, structurally as much as the lower angle fractures do. This trend will be observed as sinking through the Mahogany Zone continues. Four detail fracture lines were measured in the Upper Void Level. The location of these lines are plotted on the Figure 3. The raw fracture data has been plotted on the large Figure 1, however, the data has not been processed by computer yet, but will be as development continues. Again, as in the Ignition Level, tuff dikes are present. The same dike as mapped previously is also present in the Upper Void Level. It has the same orientation but is much thinner (N54°E, 90°) but as the dike cuts the ore pass sump, it changes orientation to a more E-W direction. Also a N45°W dike dipping 78°NE to vertical was observed cutting the shaft and water sump. An interesting observation made was water coming out of the back in the water sump on the updip side of the dike. This same feature was noted in the Ignition Level (April-May Report). These dikes may play a greater role in the local groundwater system as was first thought. Attention will be paid to these features as sinking continues. Source of the tuff for these dikes is from lower in the section. Although the fractures have not been processed, it is obvious from the fracture map, the fracture dips have steepened to 80°-90°. More detailed data will be included in the next report. Water production in the Upper Void Level to date is minimal. The area at the back of the water sump was producing 60%-70% of the total water make. The remainder of the development was fairly dry with some areas dusty. The division of the subsurface aquifer system into four units has to date accurately represented the aquifer system although even this subdivision is oversimplifying the ground water system. The UPC_2 unit is separated from the LPC_3 unit by the upper 30 feet of Mahogany Zone. When sinking begins, the LPC_3 will be penetrated and the first stress of this unit will take place. Most lower aquifer wells on C. B. are completed in the LPC_3. Some qualitative and quantitative data of this unit will be obtained during shaft sinking below the Upper Void Level. Drawdowns will be observed over time in the outlying wells on C. B. The raw fracture data is attached and will be processed later.

The Service Shaft has begun cutting the Upper Void Level and as data is collected it will be added to the Production Shaft data for processing. Refer to Figure 2 for the Service Shaft depth (5494'). Probing will take place in the Service Shaft at the sill of the Upper Void Level (5480' Elevation). Water production for the Service and Production Shafts as of July 24th was 373 gpm.

In the V/E Shaft, #8 grout cover was completed and sinking progressed to 5554' where #9 grout cover began on June 22nd and ended July 25th. A different procedure was used on this cover from previous covers. A drilling sequence was used compared to previous covers where a hole was drilled until water was encountered and grouted off. Figure 5 shows the drill pattern and Figure 6 shows #9 drilling sequence and #7, #8, and #9, cross sectional drilling coverage and #9 detailed Geology-Hydrology and drilling sequence. Representative flows encountered during drilling are plotted on the right hand side of the #9 drilling sequence log. No large flows greater than 400 gpm were encountered on this cover, also the cover ended at 126' depth which was approximately 10' below the A-groove, not deep enough to penetrate the upper 30' Mahogany Zone barrier which separates the UPC_2 from the LPC_3 aquifer unit. Number 10 grout cover should be located 65'-80' below the sill of the Ignition Level which will be developed. This cover will then penetrate the Lower Mahogany aquifer units above the B-groove in the zone where the Intermediate Void will be located. Also #10 cover will intersect the interval of the Upper Void Level. Two low angle holes were drilled out into the Ignition Level from #9 grout cover. These two holes encountered 50 and 120 gpm at 50' and 60'. Development is about to begin in the Ignition Level. As the station is developed, data will be collected and processed and included in the next report.

Attached is a breakdown on mine water flows and effects to date in the two close in monitoring wells and sources of water inflow into the shaft.

Attached is a break of sources of water inflow into each shaft for the period June 19th through June 26, 1980. For the V/E Shaft a total average water make for the period was 313 gpm. Water inflow from the 960 pump station and above was 88 gpm or 28% of total inflow. At the 1050 (old Ignition Level) there is a total of 158 gpm or 51% of total. From the bottom, 67 gpm or 21% of total water inflow.

In the Service and Production Shafts for the same period, a total of 362 gpm was measured. A breakdown of these numbers show that in the Service Shaft 11 gpm was coming into the mid-shaft above 736' depth (4% of total), 19 gpm was measured from the water ring above the Ignition Level (7% of total), 240 gpm was measured being pumped off bottom, this includes the interval 1186' to 1230' depth (89% of total). If gland water is subtracted from this total, a net 234 gpm is flowing into the Service Shaft.

The Production Shaft breaks down to 11 gpm from mid-shaft station to the surface (7% of total), 50 gpm from the Ignition Level and above (31% of total) and 100 gpm off bottom, the interval 1182' to 1319' (62% of total inflow). Again subtracting gland water, a net of 128 gpm is flowing into the Production Shaft.

From looking at these numbers, the first question is why so high a percent of total inflow into the Service and Production Shafts is on the bottom? This can be answered by the fact that the largest percent of bottom inflow is not from the bottom but from the Ignition Level development. I estimate 80% of the 89% off bottom in the Service and 55% of the 62% off bottom in the Production coming out of the Ignition Level development. Water is cascading over the edge of the station and is either being caught in a water-ring below the stations and runs down a 4" hose to the bottom or runs down the shaft walls to the bottom. Roughly 70% to 80% of total Service/Production Shaft inflow is from the Ignition Level. As probing has indicated, little additional inflow is being encountered at the shaft bottom. The majority of new water encountered is in vugs and bleeds off rapidly.

The large attached graph illustrates the effect of shaft sinking on the two close in wells; 33X-1 at V/E Shaft and 32X-12 at Service/Production Shafts. As can be seen, the major increases in water production occurs during station development. At the V/E, at the 1050' excavation the greatest increase in water occurred but is now into a decline period. At the Service/Production Shafts the greatest increase was during the Ignition Level development. Comparing these three water production curves with the drawdown curves of the two wells, it is readily apparent the shafts are pulling the water level down. At the present time, the two wells are dropping at a rate of around 2' per day. If this trend continues, the water level in the immediate vicinity of the V/E and Service/Production Shafts will be down to the A-groove in one year.

A 1900 gpm inflow was predicted from all three shafts by January 1, 1980. This nubmer may have to be revised based on the latest probing in the Service and Production Shafts and the results of new water inflows encountered in the Ignition Level development off the V/E Shaft which will be completed within the next two months. The latest probing in the Service/Production Shafts encountered minimal (10 gpm) flows within 50 feet of the B-Groove. Based on past experience during drilling on C. B., water production decreased below the Mahogany Zone. The oil shale fracture frequency becomes less and fractures become tighter. Figure 7 shows the results of the pump spinner tests of 33X-1 and 32X-12. Below the B-grove, few and small water zones were observed. At present (July 7, 1980), a total of 661 gpm is flowing into all three shafts; 310 gpm in the V/E and 351 gpm into the

Service/Production Shafts. Even with these minimal inflows, the water levels of the two close in monitoring wells are dropping at a rate of 2 feet per day as mentioned previously.

Nick Stellavato / mdo
Nick Stellavato

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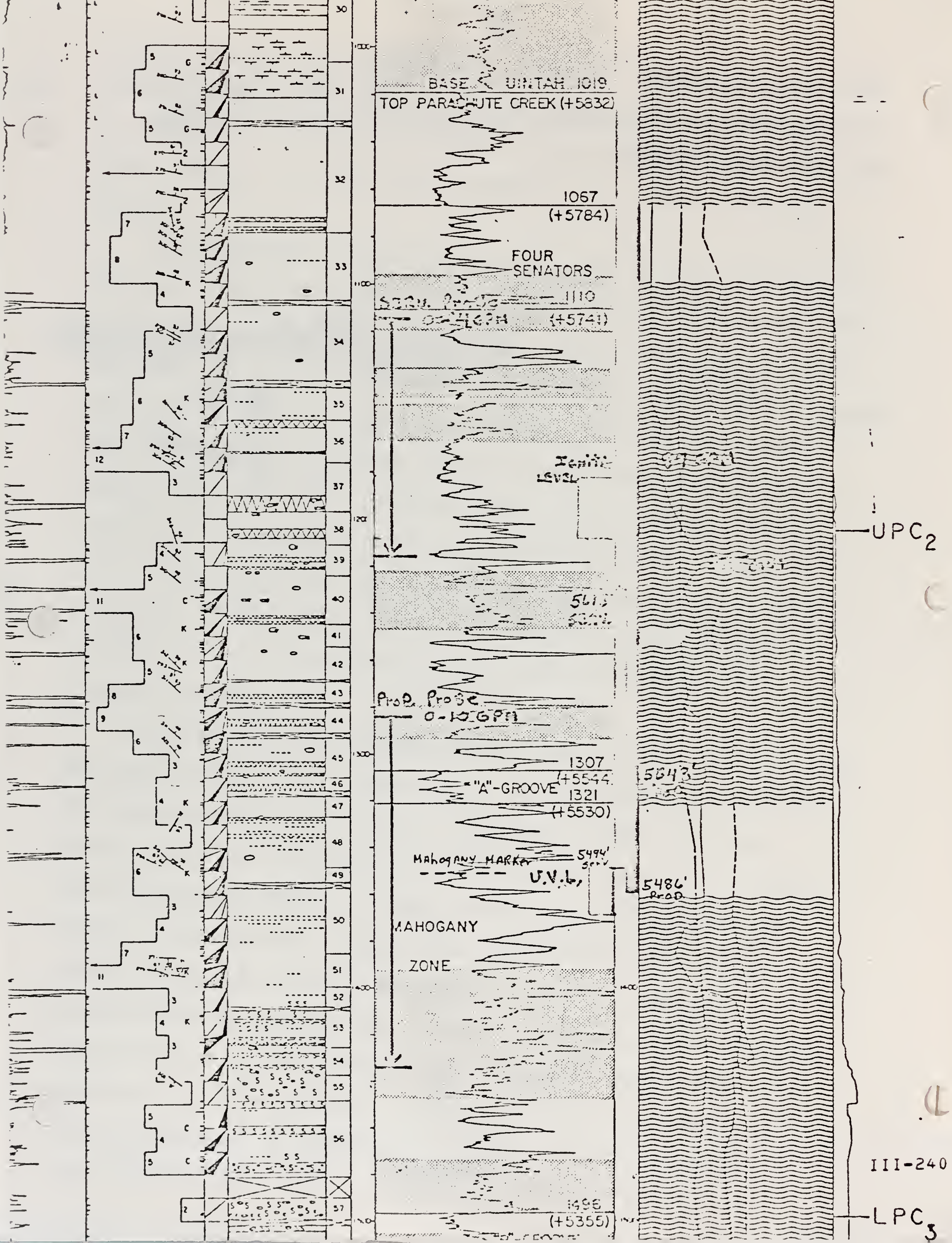
NS/rla

Figure 2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TOP PARACHUTE CREEK (+5832)
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1110
(+5741)
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MAHOGANY ZONE
Ignition LEVEL
5613
Prob. Probe
0-10 GPT
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5643
Mahogany Marker
5494' Serv
U.V.L.
5486' Prod
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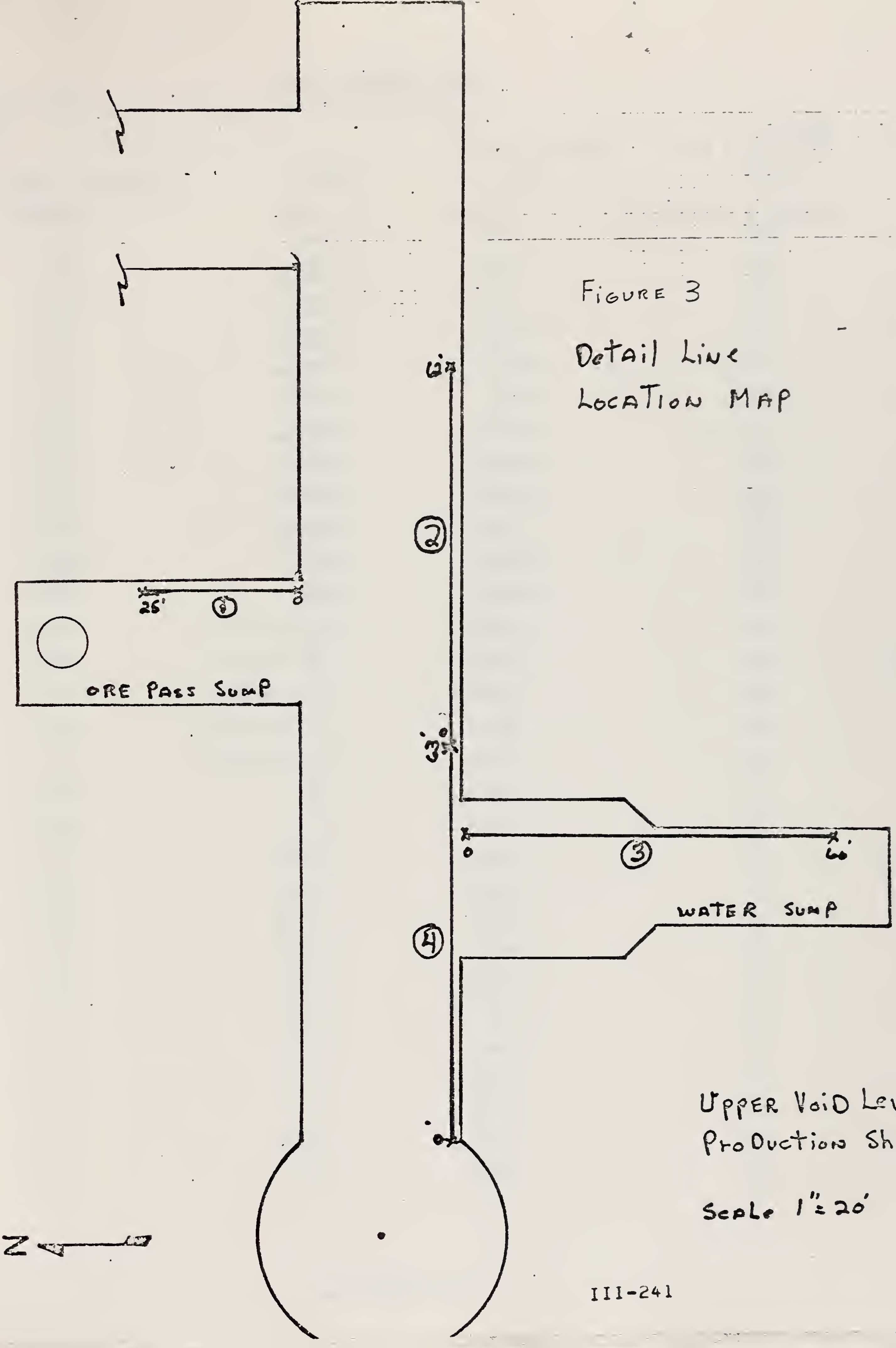


Figure 3

Detail Line Location Map

Upper Void Level
Production Shaft

Scale 1" = 20'

DETAIL FRACTURE LINE

South Rib
Upper Void Level - Production Side

DISTANCE ALONG LINE	STRIKE	DIP	AZIMUTH
0	N70°E	82°NW	250°
0	N25°W	80°NE	335°
0.7'	N25°W	80°NE	335°
2.5'	N10°E	78°NW	190°
2.5'	E-W	70°N	270°
9'-16'	N70°E	85°NW	250°
17'	N70°W	85°NE	290°
21'	N80°W	87°NE	280°
21'	N60°E	84°NW	240°
23'	N60°E	90°	060°
30'	N35°E	90°	035°
31'	N60°W	90°-Variable	060°
34'	N60°W	90°-Variable	060°
36'	N60°W	90°-Variable	060°
40'	N60°W	90°-Variable	060°
45'	N20°E	90°-Variable	020°
47'	N60°W	90°	060°
50'	N60°W	90°	060°
53'	N30°E	80°NW	210°
53'	N80°W	81°NE	280°
60'	N70°W	81°NE	290°
63'	N5°E	73°NW	185°
64'	N80°W	74°NE	280°
66'	E-W	83°N	270°
67'	E-W	83°N	270°
68'	N88°W	82°NE	272°
78'	N40°E	90°	040°
80'	N85°W	68°NE	275°
85'	N72°W	90°	288°

South Rib
Upper Void Level - Production Side (Cont.'d)

DISTANCE ALONG LINE	STRIKE	DIP	AZIMUTH
86'	N80°W	90°	280°
86'	N20°E	90°	020°
90.5'	N75°W	90°	285°
102'	N72°W	85°NE	288°
108'	N65°W	75°NE	295°
110'	N70°W	85°NE	290°
114'	N65°W	78°SW	115°
116'	N60°W	80°SW	120°
118'	N60°W	80°SW	120°
119'	N70°W	90°	290°
120.5'	N72°W	88°NE	288°
125'	N55°W	72°SW	125°

DETAIL LINE

Water Sump - East Rib
Upper Void Level

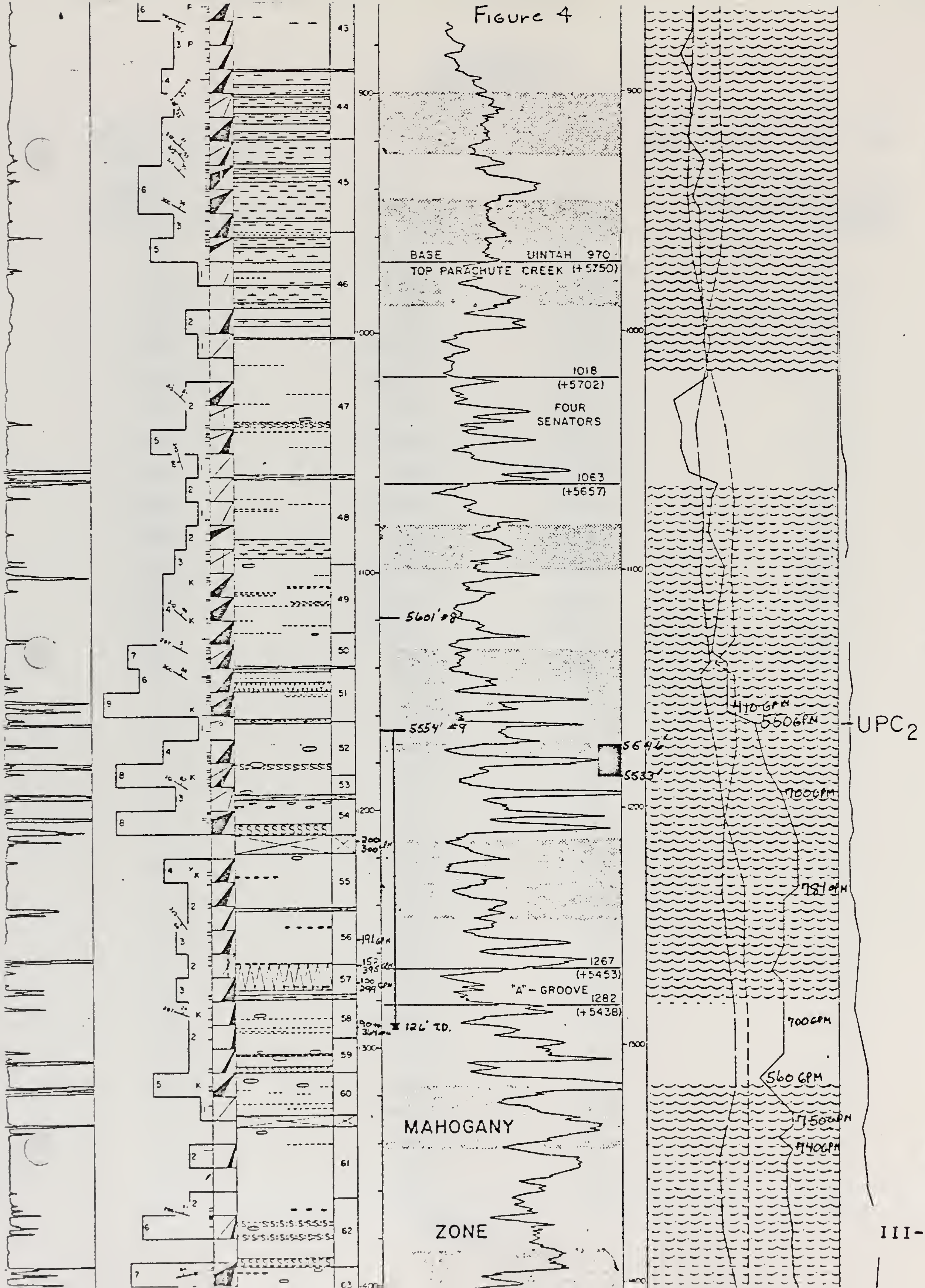
DISTANCE ALONG LINE	STRIKE	DIP	AZIMUTH
1.0'	N85°W	84°NE	275°
3.0'	N76°E	80°NW	256°
3.5'	N76°E	80°NW	256°
4.0'	N76°E	80°NW	256°
5.0'	N76°E	80°NW	256°
9.0'	N88°E	87°NW	268°
10'	N88°E	87°NW	268°
12'	N88°W	70°SW	92°
16'	N75°W	84°NE	285°
18.8'	N75°W	86°NE	285°
22.2'	N70°W	90°	290°
26'	E-W	87°N	270°
30'	N65°E	90°	065°
34.5'	N82°W	56°NE	082°
37'	N82°W	56°NE	082°
39'	N65°W	85°SW	115°
41.5'	N88°W	60°NE	272°
43'	N75°E	74°NW	255°
44'	N75°E	74°NW	255°
45'	N75°E	74°NW	255°
46'	N75°E	74°NW	255°
46.5'	N75°E	74°NW	255°
47'	N64°W	75°SW	116°
50'	N75°E	57°NW	255°
50'	N75°W	77°NE	285°
51.5'	N75°W	77°NE	285°
52.5'	N60°W	77°NE	300°
54'	N60°W	84°NE	300°
56'	N80°W	85°NE	280°
58'	N88°W	80°NE	272°
60'	N54°W	84°NE	306"

DETAIL LINE

East Rib - Ore Pass Sump

DISTANCE ALONG LINE	STRIKE	DIP	AZIMUTH
0'	N78°W	74°SW	102°
2'	E-W	90°	270°
3'	N64°W	40°	296°
5'	N10°E	86°NW	190°
6.5'	N85°W	74°NE	275°
7'	N85°W	90°	275°
8.5'	N40°E	62°SE	040°
12'	N60°E	90°	060°
13'	N30°E	80°SE	030°
17'	N80°E	90°	080°
19'	N75°E	60°SE	075°
20'	N75°E	60°SE	075°
21'	N75°E	60°SE	075°
25'	N60°E	90°	060°

Figure 4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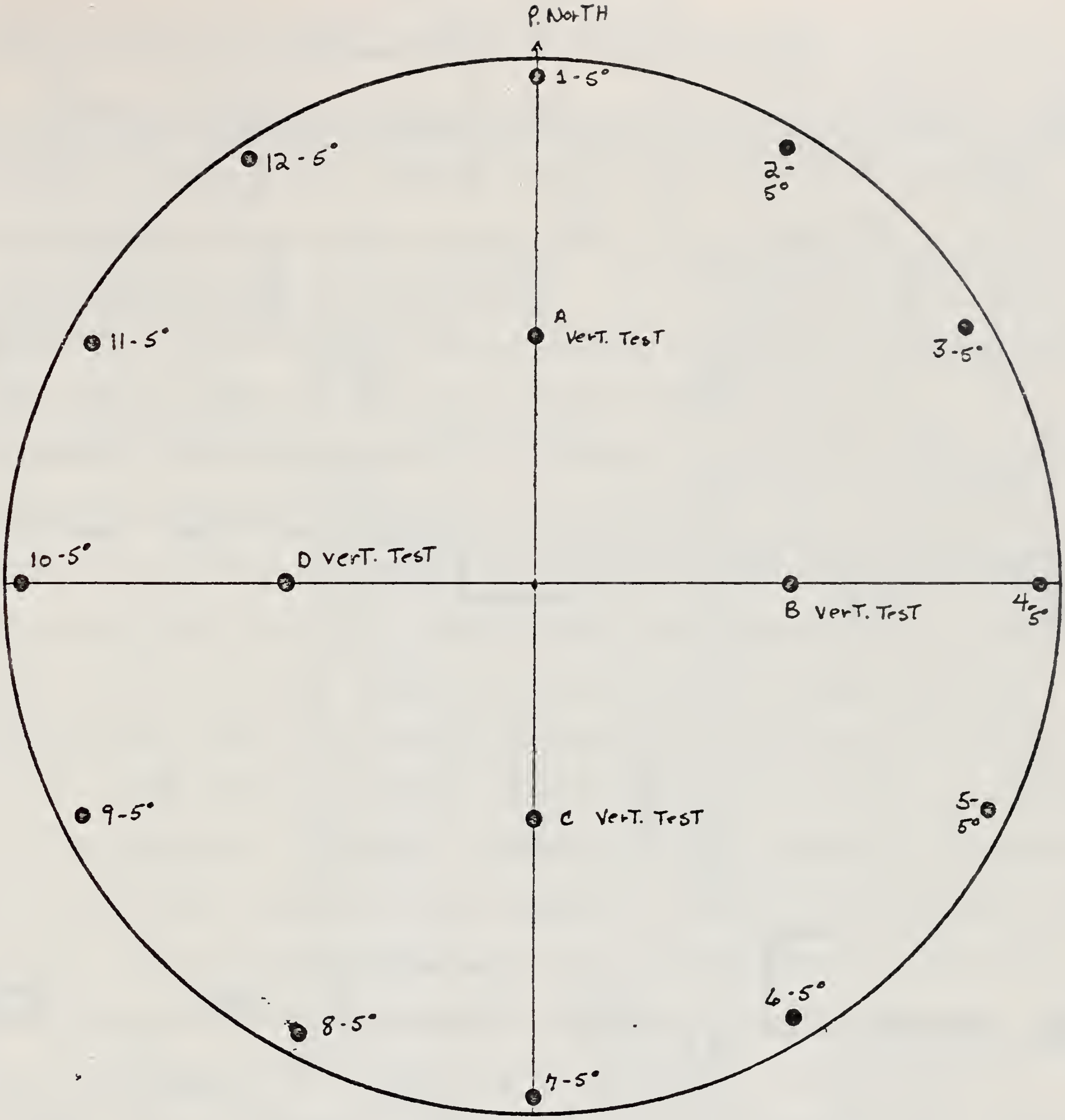
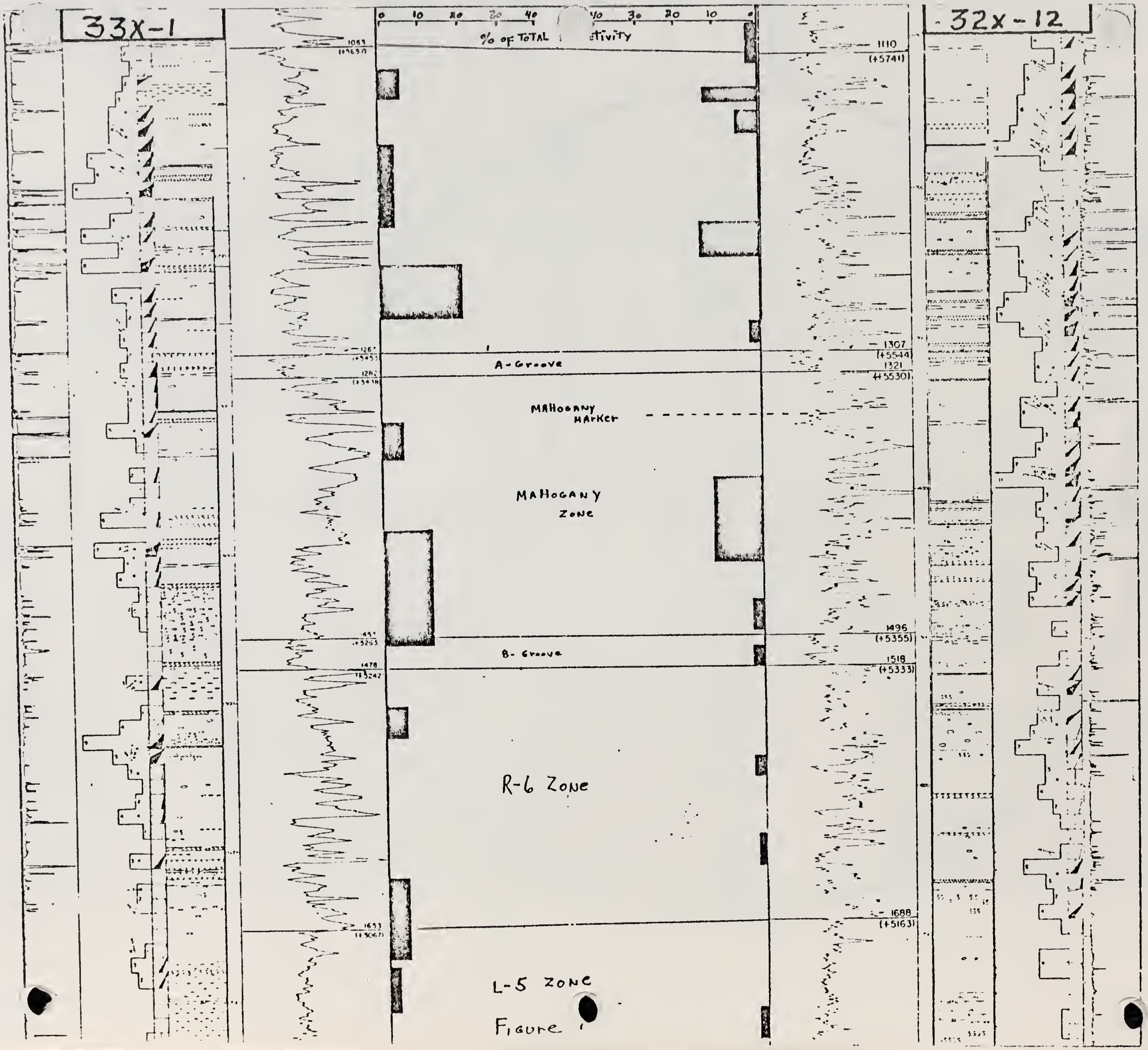
61
62
63
900
1000
1100
1200
1300
1400
BASE UINTAH 970
TOP PARACHUTE CREEK (+5750)
1018
(+5702)
FOUR SENATORS
1063
(+5657)
5601' #8
5554' #9
5646'
5533'
410 GPM
550 GPM
UPC$_2$
700 GPM
781 GPM
200
300 GPM
191 GPM
152
395 GPM
150
299 GPM
90
304 GPM
126' T.D.
1267
(+5453)
"A" - GROOVE
1282
(+5438)
700 GPM
560 GPM
750 GPM
940 GPM
MAHOGANY
ZONE



9 GrouT Cover Drilling PaTTern
1-12 - SLANT out AT 5°
A-D - Verticle TesT Holes

Figure 5


33X-1
32X-12
0 10 20 30 40
40 30 20 10 0
% of TOTAL ...tivity
1083
1110
(+5741)
1307
(+5544)
1321
(+5530)
A-Groove
MAHOGANY MARKER
MAHOGANY ZONE
1478
1496
(+5355)
1518
(+5333)
B-Groove
R-6 Zone
1693
1688
(+5163)
L-5 ZONE

Figure

REPORT FOR THE PERIOD

AUGUST 1, 1980, TO SEPTEMBER 30, 1980

The Upper Void Level development was completed during this period. 75% of the station development was completed from the Service Shaft, the Production Shaft completed the east drift, ore pass sump, and water sump, then began sinking toward the Intermediate Void Level. Figure 1 is the Upper Void Level plan map containing all fracture data collected, dikes encountered during drifting, and other important features. Among these important geologic features, was the appearance of the Mahogany Marker in the station. This is the most important stratigraphic marker bed in the basin. It is a 6" to 8" thick tuff bed, and was present in the station approximately 5' below the brow concrete in both the Service and Production Shafts. Figure 2 shows the Mahogany Marker cut by the largest of the tuff dikes. Origin of the dikes was first thought to be the Mahogany Marker (since they are both composed of tuff) but from this picture it is quite obvious the dike originates somewhere below this elevation. No thinning of the Mahogany Marker is evident. From the elevations obtained on this marker in the two shafts, a dip of 1.9° was obtained to the North, Production Shaft elevation 5502' and Service Shaft 5497'. The large tuff dike which is cutting the marker trends N54°E and is the dike which cuts through the ore pass sump.

All fracture data in the Upper Void Level has now been processed and is attached. From the stereonet, the major fracture set in this level is N72°W and dipping 83°NE with the other less dominant sets of N75°W, 87°SW, N57°E, 82°NW, and N88°E, 87°S. Comparing the Upper Void Level data with the Ignition and Mid-Shaft Station (April-May, 1980 Report), the dips of the major sets are steepening from 55° to 62° at the Mid-Shaft Station, to 62° at the Ignition Level to 83° to 87° at the Upper Void Level, also the number of fractures are diminishing. Fracture spacing has not been determined yet but will be by computer in the future. During development of the North-South connecting drift, five dikes were encountered during mapping. The first two dikes seen (mapping North to South) are shown in Figure 3. The top picture shows the largest of these two dikes, the lower picture shows both of these dikes. Figure 4 shows the third dike which trends N85°E, 90°, and is discontinuous. Again, as seen on the Ignition Level, water was weeping into the station (North-South) drift in the area of the dikes, refer to Figure 1. The rock in this station was of excellent quality, fracture frequency was less than above with very little water coming into the station. Figure 5 shows the excellent rock back which was smooth the entire length of the North-South drift. From evidence seen in this station, the upper 50' of Mahogany Zone acts as a barrier to water moving up or down the stratigraphic section. The only areas where water was coming into the station was near the dikes which broke the continuity of the good oil shale rock and in the water sump coming out of a split set rock bolt. Figure 6 is the geologic log showing progress to date for the Service/Production Shafts. The Service Shaft is now probing 5446' elevation. Daily water production totaled 325 gpm from the Service/Production Shafts combined. Figure 7 shows the water production - activity curves and the effects of the shaft dewatering on 32X-12 corehole water level. Any increase in water from the Upper Void Level down will be stressing the LPC_3 aquifer unit. Early results indicate little water in storage in this unit at the Service/Production Shafts around the Mahogany Marker and from probing exercises, little water was encountered in the Lower Mahogany-"B" groove area. The Production Shaft has now completed the top bench of the Intermediate Void Level, East heading. The rock quality is not good as in the Upper Void Level due to the large amount of leached solution brecciated barron oil shale - marlstone rock of the lower Mahogany-"B" groove. Total water production is 50 to 75 gpm in this station with the majority 30 gpm coming out of a fractured vug on the west edge of the shaft. Response in 32X-12 has been dramatic. The water level is falling at a rate of 5' per day since the Intermediate Void Level has been started. This hints that very little water is in storage, and with a little dewatering in this zone, effects around the shaft are immediate.

In the V/E Shaft, the #9 grout cover is finished and the Ignition Level (1170') station was excavated. The largest increase of water was encountered in this zone. This is not surprising because during drilling of 33X-1, the largest increase in water flows was also encountered, refer to Figure 8. This zone is highly fractured as the caliper log and the fracture density histogram shows, also water flows almost doubled during drilling through this zone. An interesting point is the water production went from 335 gpm to 830 gpm in the shaft during development of this station, the water level in 33X-1 began to slowly rebuild, then leveled off and is now starting back down but very slowly. Also the water level in 32X-12 is now 50' lower than in 33X-1 whereas the converse has always been true. These wells will be monitored closely to see what effects do happen as the V/E Shaft sinks into the Mahogany Zone and development takes place on the Upper Void Level station.

Fracture data was collected in the Ignition Level and processed for comparison with previous data (Figure 9 and 10). The 960 pump station data shows dips in the 50° to 70° range whereas the Ignition Level data shows only two sets dipping 77° to 88°.

After completion of the station, sinking began to 5478' where #10 grout cover was begun. Figure 11 is a geologic-hydrologic log used to predict water flows and rock types that would be encountered during drilling of #10 cover. As can be seen, flows encountered were minimal with a maximum flow encountered of

260 gpm at 78' which bled off as was the case with the other holes. Sinking is now progressing toward the Upper Void Level station which will be in the Mahogany Zone. The Mahogany Marker should be located in this station. Detailed mapping of this development will be done since much more drift will be opened on this level than on previous levels.

N Stellavato

Nick Stellavato, Consultant

NS/mdb

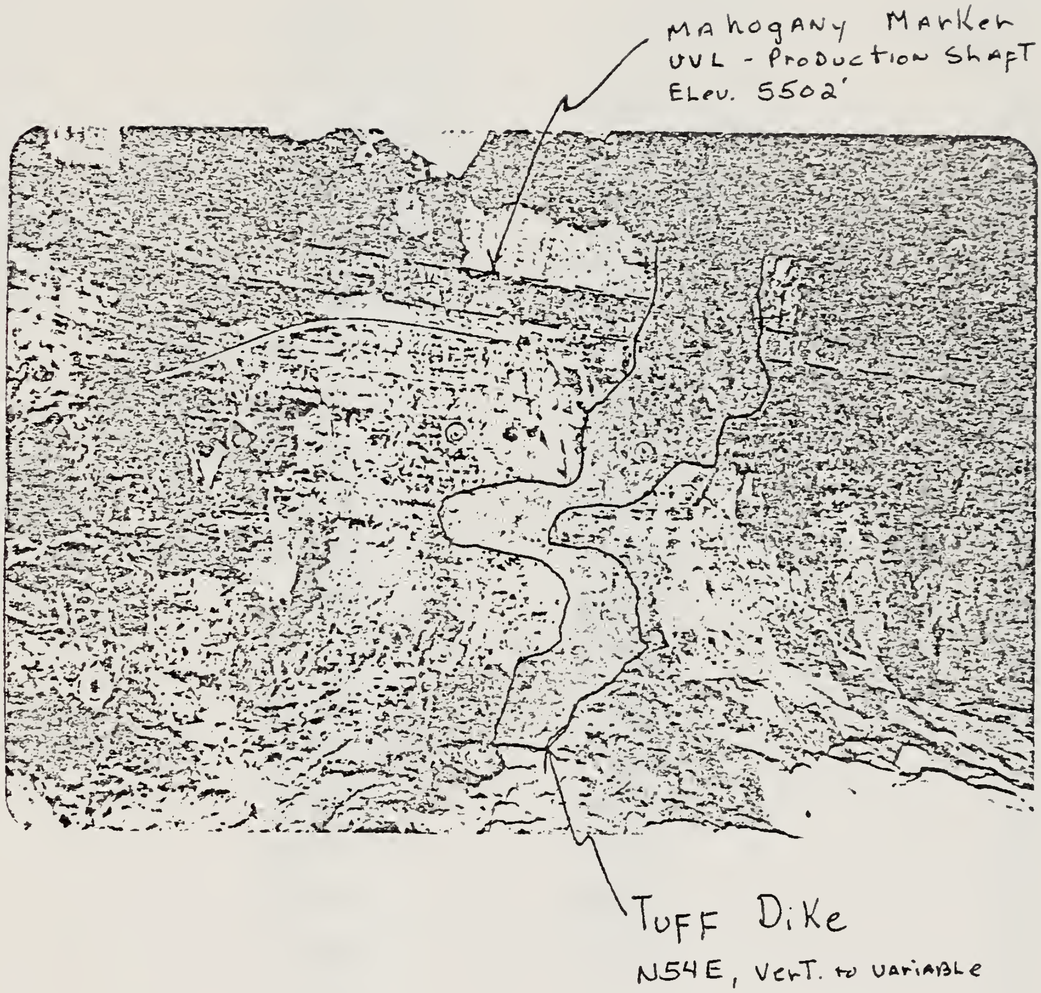

Mahogany Marker
UVL - Production Shaft
Elev. 5502'
Tuff Dike
N54E, Vert. to variable

Figure 2

DETAIL FRACTURE LINE

South Rib
Upper Void Level - Production Side

DISTANCE ALONG LINE	STRIKE	DIP	AZIMUTH
0	N70°E	82°NW	250°
0	N25°W	80°NE	335°
0.7'	N25°W	80°NE	335°
2.5'	N10°E	78°NW	190°
2.5'	E-W	70°N	270°
9'-16'	N70°E	85°NW	250°
17'	N70°W	85°NE	290°
21'	N80°W	87°NE	280°
21'	N60°E	84°NW	240°
23'	N 0°E	90°	060°
30'	N35°E	90°	035°
31'	N60°W	90°-Variable	060°
34'	N60°W	90°-Variable	060°
36'	N60°W	90°-Variable	060°
40'	N60°W	90°-Variable	060°
45'	N20°E	90°-Variable	020°
47'	N60°W	90°	060°
50'	N60°W	90°	060°
53'	N30°E	80°NW	210°
53'	N80°W	81°NE	280°
60'	N70°W	81°NE	290°
63'	N5°E	73°NW	185°
64'	N80°W	74°NE	280°
66'	E-W	83°N	270°
67'	E-W	83°N	270°
68'	N88°W	82°NE	272°
78'	N40°E	90°	040°
80'	N85°W	68°NE	275°
85'	N72°W	90°	288°

South Rib
Upper Void Level - Production Side (Cont.'d)

DISTANCE ALONG LINE	STRIKE	DIP	AZIMUTH
86'	N80°W	90°	280°
86'	N20°E	90°	020°
90.5'	N75°W	90°	285°
102'	N72°W	85°NE	288°
108'	N65°W	75°NE	295°
110'	N70°W	85°NE	290°
114'	N65°W	78°SW	115°
116'	N60°W	80°SW	120°
118'	N60°W	80°SW	120°
119'	N70°W	90°	290°
120.5'	N72°W	88°NE	288°
125'	N55°W	72°SW	125°

DETAIL LINE

Water Sump - East Rib
Upper Void Level

DISTANCE ALONG LINE	STRIKE	DIP	AZIMUTH
1.0'	N85°W	84°NE	275°
3.0'	N76°E	80°NW	256°
3.5'	N76°E	80°NW	256°
4.0'	N76°E	80°NW	256°
5.0'	N76°E	80°NW	256°
9.0'	N88°E	87°NW	268°
10'	N88°E	87°NW	268°
12'	N88°W	70°SW	92°
16'	N75°W	84°NE	285°
18.8'	N75°W	86°NE	285°
22.2'	N70°W	90°	290°
26'	E-W	87°N	270°
30'	N65°E	90°	065°
34.5'	N82°W	56°NE	082°
37'	N82°W	56°NE	082°
39'	N65°W	85°SW	115°
41.5'	N88°W	60°NE	272°
43'	N75°E	74°NW	255°
44'	N75°E	74°NW	255°
45'	N75°E	74°NW	255°
46'	N75°E	74°NW	255°
46.5'	N75°E	74°NW	255°
47'	N64°W	75°SW	116°
50'	N75°E	57°NW	255°
50'	N75°W	77°NE	285°
51.5'	N75°W	77°NE	285°
52.5'	N60°W	77°NE	300°
54'	N60°W	84°NE	300°
56'	N80°W	85°NE	280°
58'	N88°W	80°NE	272°
60'	N54°W	84°NE	306"

DETAIL LINE

East Rib - Ore Pass Sump

DISTANCE ALONG LINE	STRIKE	DIP	AZIMUTH
0'	N78°W	74°SW	102°
2'	E-W	90°	270°
3'	N64°W	40°	296°
5'	N10°E	86°NW	190°
6.5'	N85°W	74°NE	275°
7'	N85°W	90°	275°
8.5'	N40°E	62°SE	040°
12'	N60°E	90°	060°
13'	N30°E	80°SE	030°
17'	N80°E	90°	080°
19'	N75°E	60°SE	075°
20'	N75°E	60°SE	075°
21'	N75°E	60°SE	075°
25'	N60°E	90°	060°

DETAIL FRACTURE DATA

Upper Void Level - NS Drift

LINE 1
North Stub - East Rib

DISTANCE	STRIKE	DIP	AZIMUTH
0'	N75°W	80°NE	285°
2'	N75°W	80°NE	285°
8'	N52°W	50°SW	128°

North - South Drift

Origin NE Corner

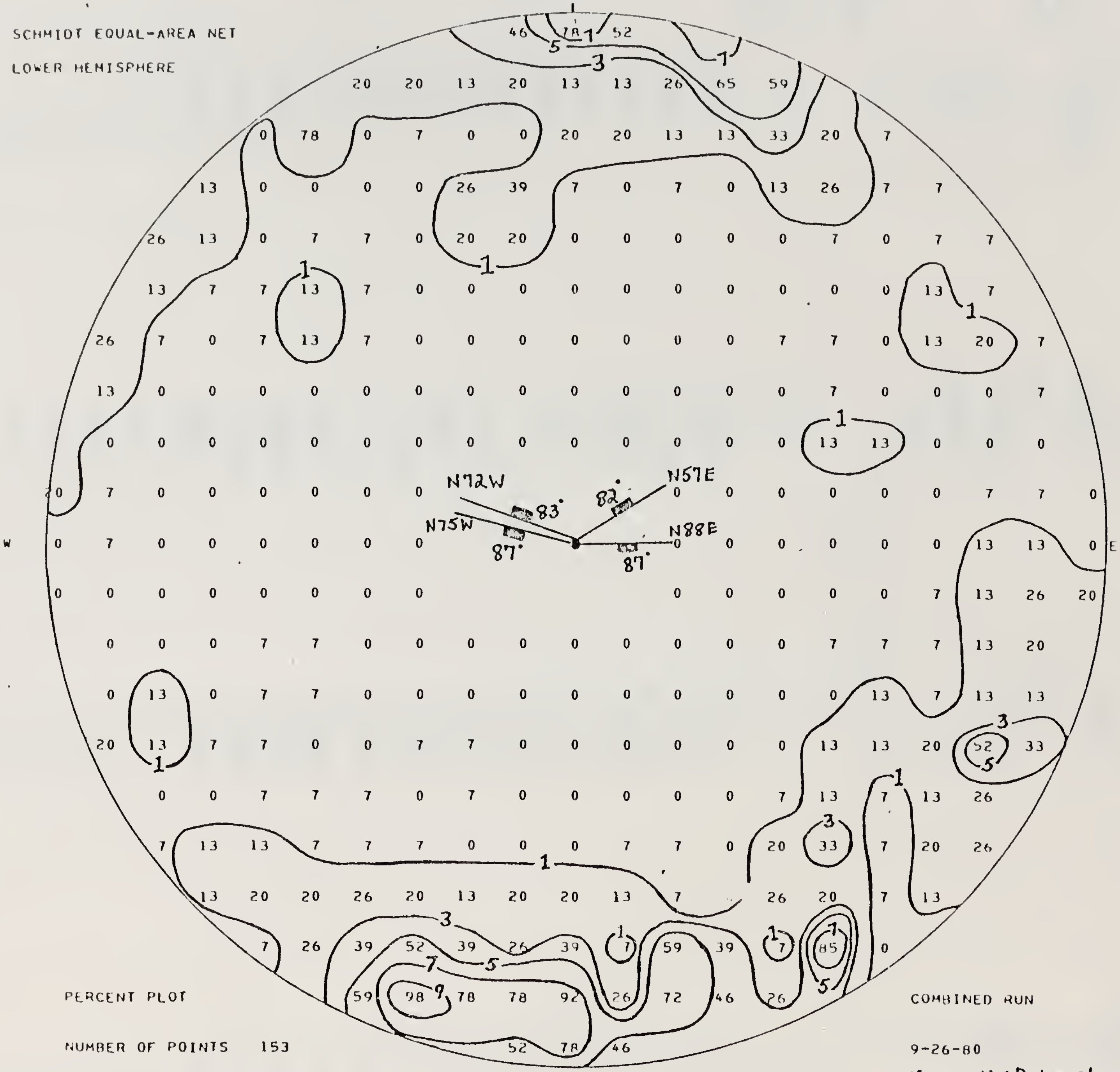
3'	N70°W	74°NE	290°
7'	N68°W	62°NE	292°
11'	N67°W	68°NE	293°
18'	N68°W	75°NE	292°
21'	N40°E	62°NW	220°
28'	N25°E	80°NW	205°
35'	N52°W	62°NE	308°
40'	N45°W	78°NE	315°
46'	N60°W	80°NE	300°
53'	N30°E	71°SE	150°
56'	N28°E	78°NW	208°
67'	N45°W	80°NE	315°
72'	N37°E	90°	037°
83'	N27°E	60°NW	207°
88'	N30°E	82°NW	210°
89'	E-W	67°N	270°
105'	N60°E	90°	060° 6" Dike
107'	N60°E	90°	060° 6" Dike
107'	N25°E	81°NW	205°
118'	N55°E	64°NW	235°
123'	N55°E	71°NW	235°
125'	N55°E	68°NW	235°-Frac.Zo
135'	N22°W	50°NE	338°
141'	N40°E	86°NW	220°
144'	N28°E	74°NW	208°

North-South Fracture Line
Upper Void Level (Cont.'d)

DISTANCE	STRIKE	DIP	AZIMUTH	
150'	N64°W	85°NE	296°	
151'	N56°E	65°NW	236°	
158.5'	N25°E	87°NW	205°	
165'	N86°W	79°NE	274°	5" Dike Stops 3.5 from back
165'	N15°E	64°NW	195°	
171'	N80°W	79°NE	280°	
173'	N50°E	73°NW	230°	
178'	N62°E	90°	062°	1" Dike Offset 1' to left at 9' above bottom
181'	N10°E	83°NW	190°	
184'	N81°E	90°	081°	
186'	N83°W	83°SW	097°	
186.5'	E-W	68°S	090°	
187.8'	N88°E	78°SE	088°	
190'	N85°E	90°	085°	1" Dike
195'	N78°W	69°SW	102°	
197.5'	N30°E	72°NW	210°	
197.5'	N70°W	90°	290°	
200'	N73°E	90°	073°	1" Dike
204'	N20°W	50"SW	160°	
207'	N20°W	50°SW	160°	
210'	N40°W	83°SW	140°	
211	N54°W	78°SW	126°	

SCHMIDT EQUAL-AREA NET

LOWER HEMISPHERE



5502' Elev.

PERCENT PLOT

NUMBER OF POINTS 153

COMBINED RUN

9-26-80

Upper Void Level

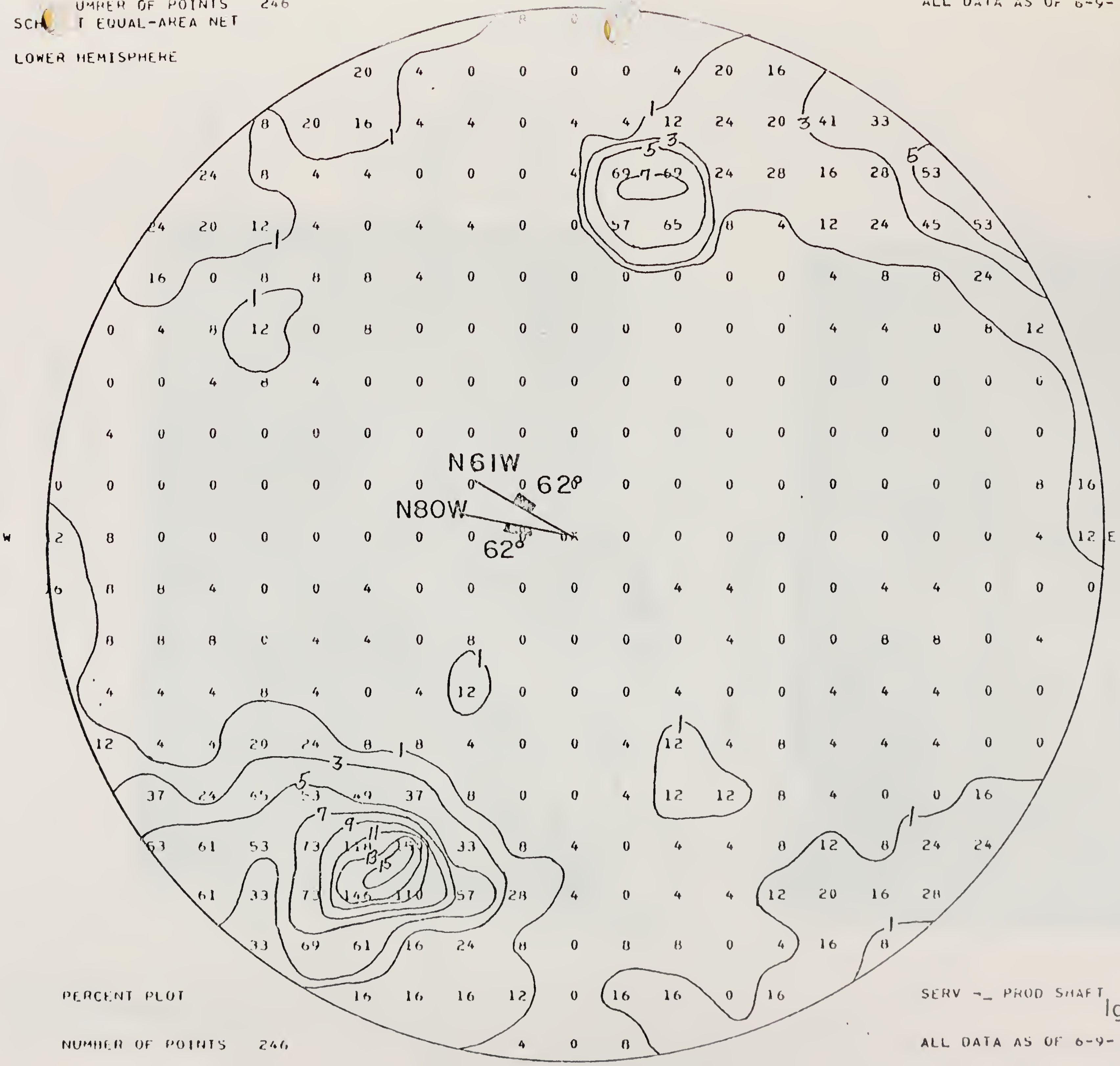
5481' to 5512'

ALL DATA AS OF

UMBER OF POINTS 246
SCH T EQUAL-AREA NET

LOWER HEMISPHERE

ALL DATA AS OF 6-9-



5670' ELEV

PERCENT PLOT

NUMBER OF POINTS 246

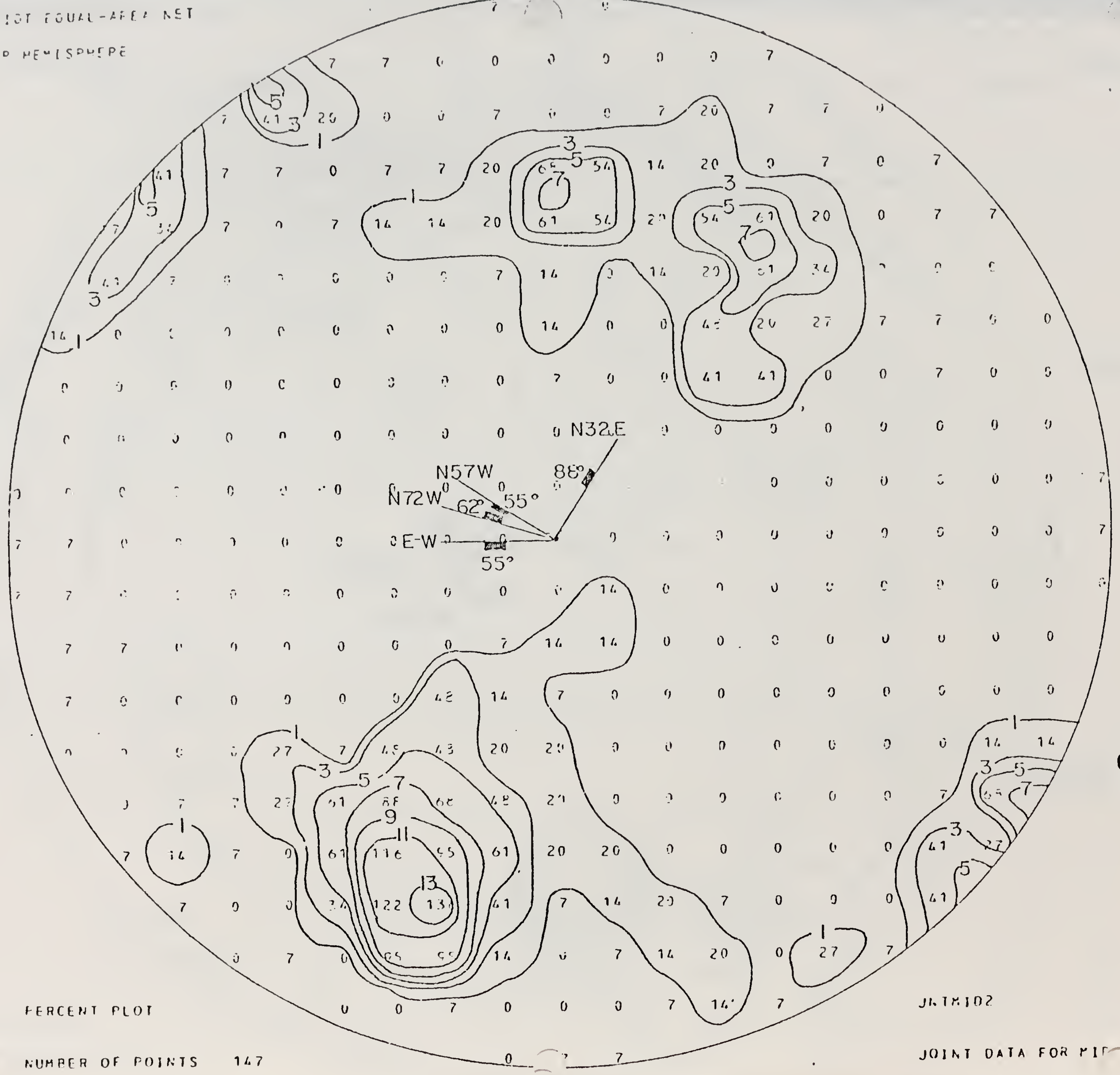
SERV -_ PROD SHAFT

Ignition level

ALL DATA AS OF 6-9-

SCHMIDT EQUAL-AREA NET

LOWER HEMISPHERE



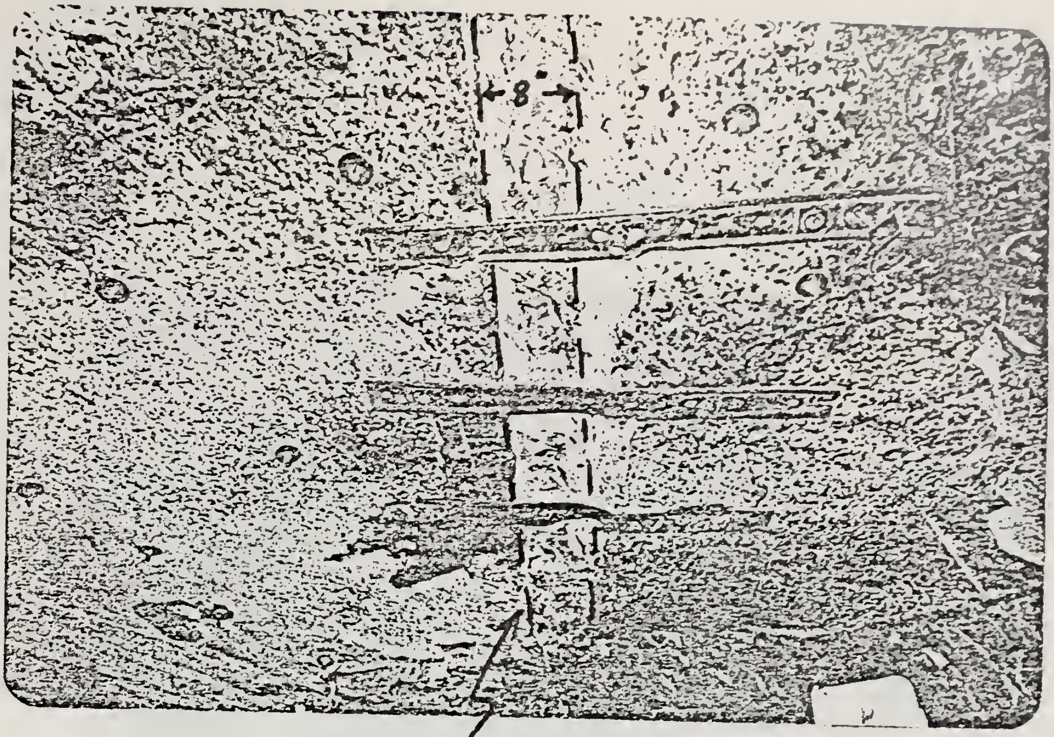
6093' ELEV

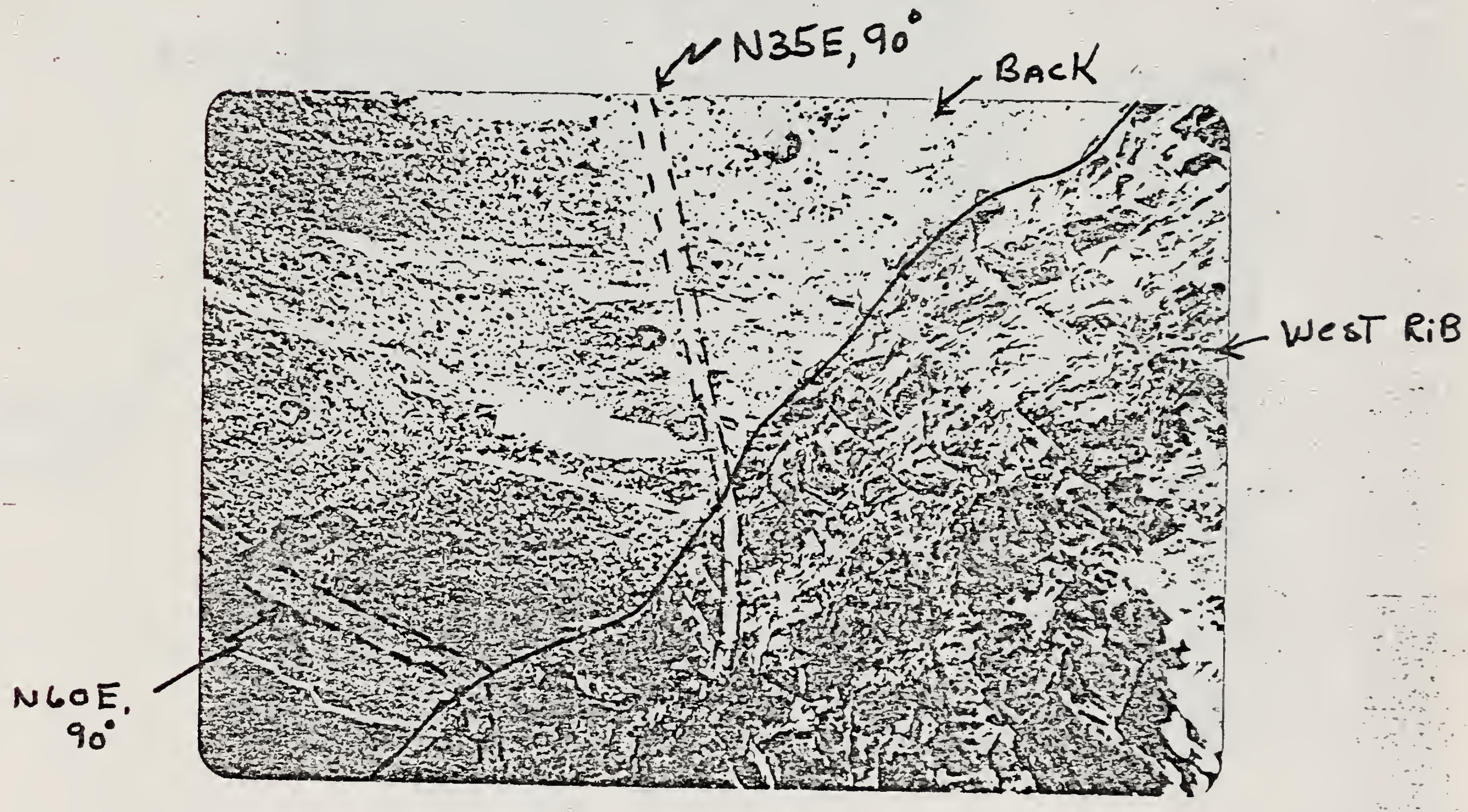
PERCENT PLOT

NUMBER OF POINTS 147

JNTMI02

JOINT DATA FOR PI





NortH - SouTH DrifT

Figure 3

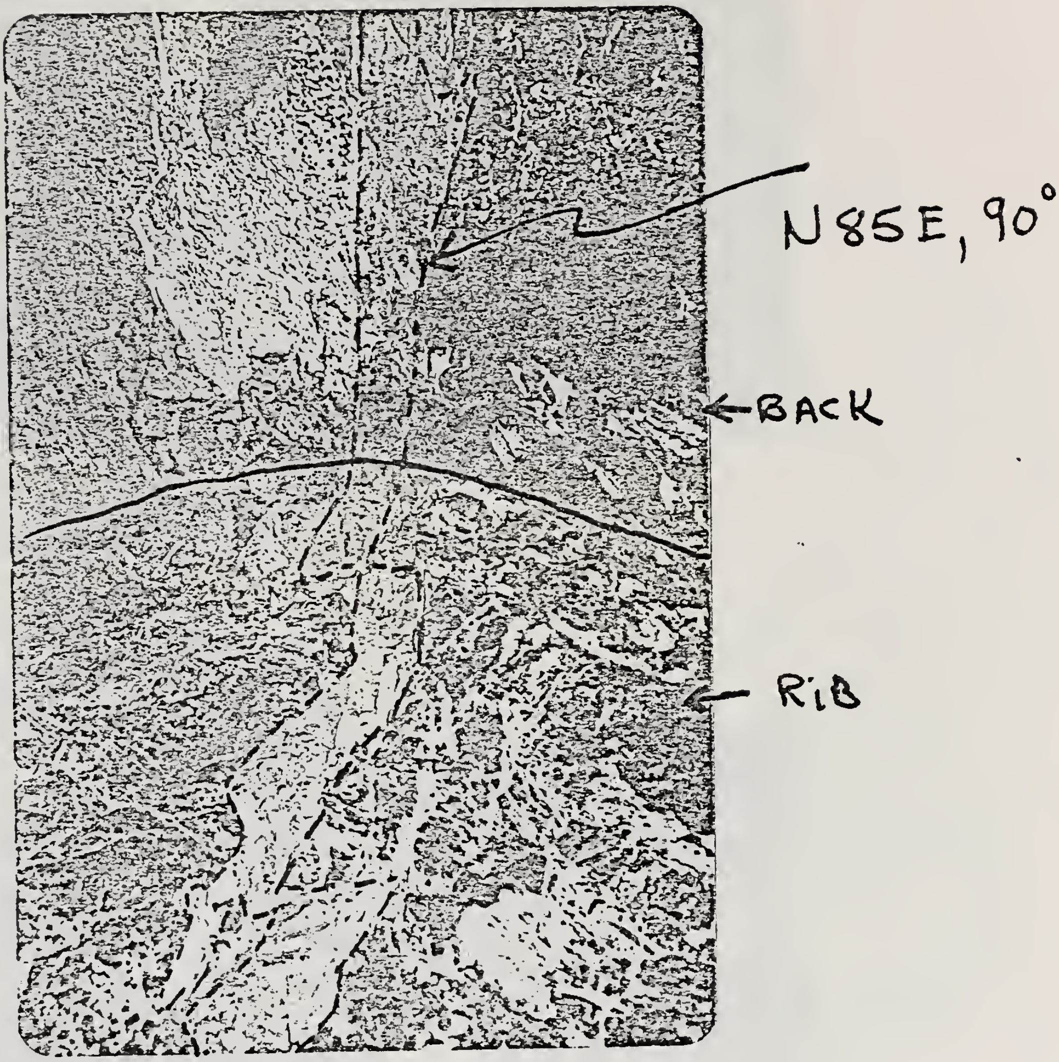
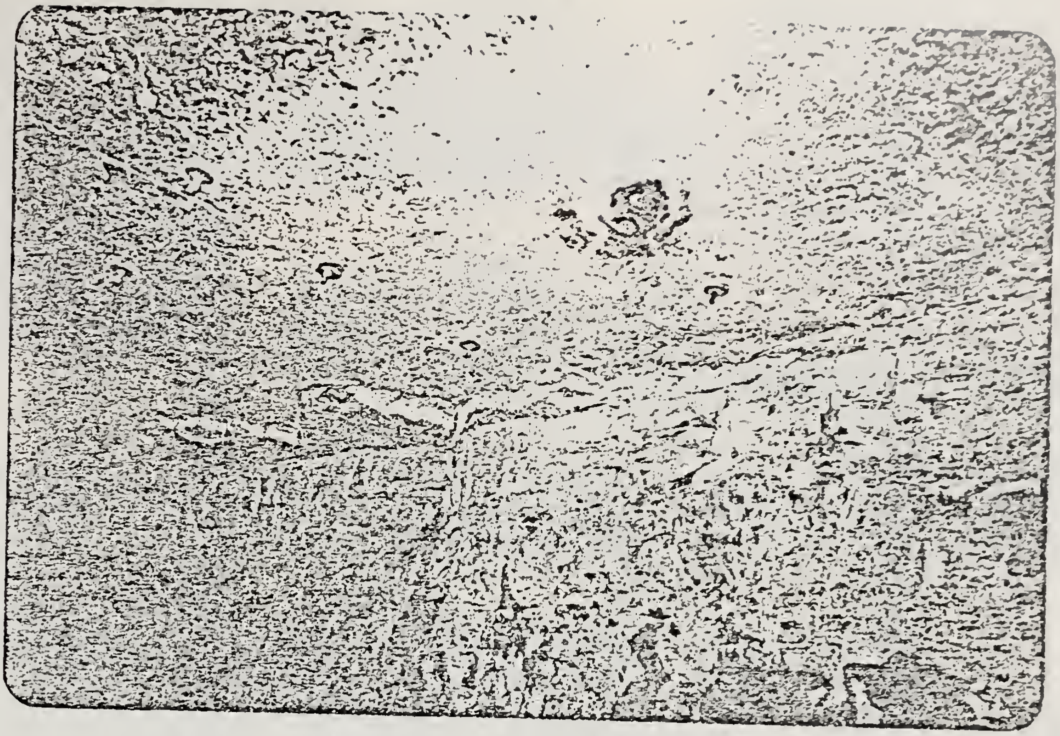
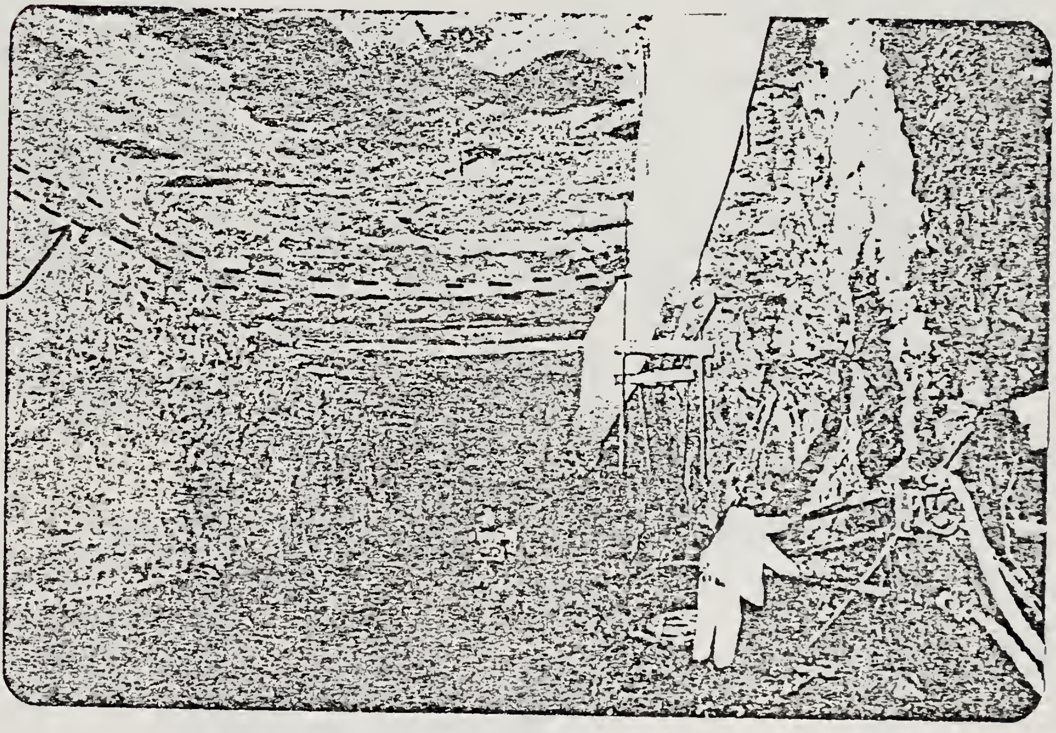


Figure 4



Good Back in N-S connecting Drift.

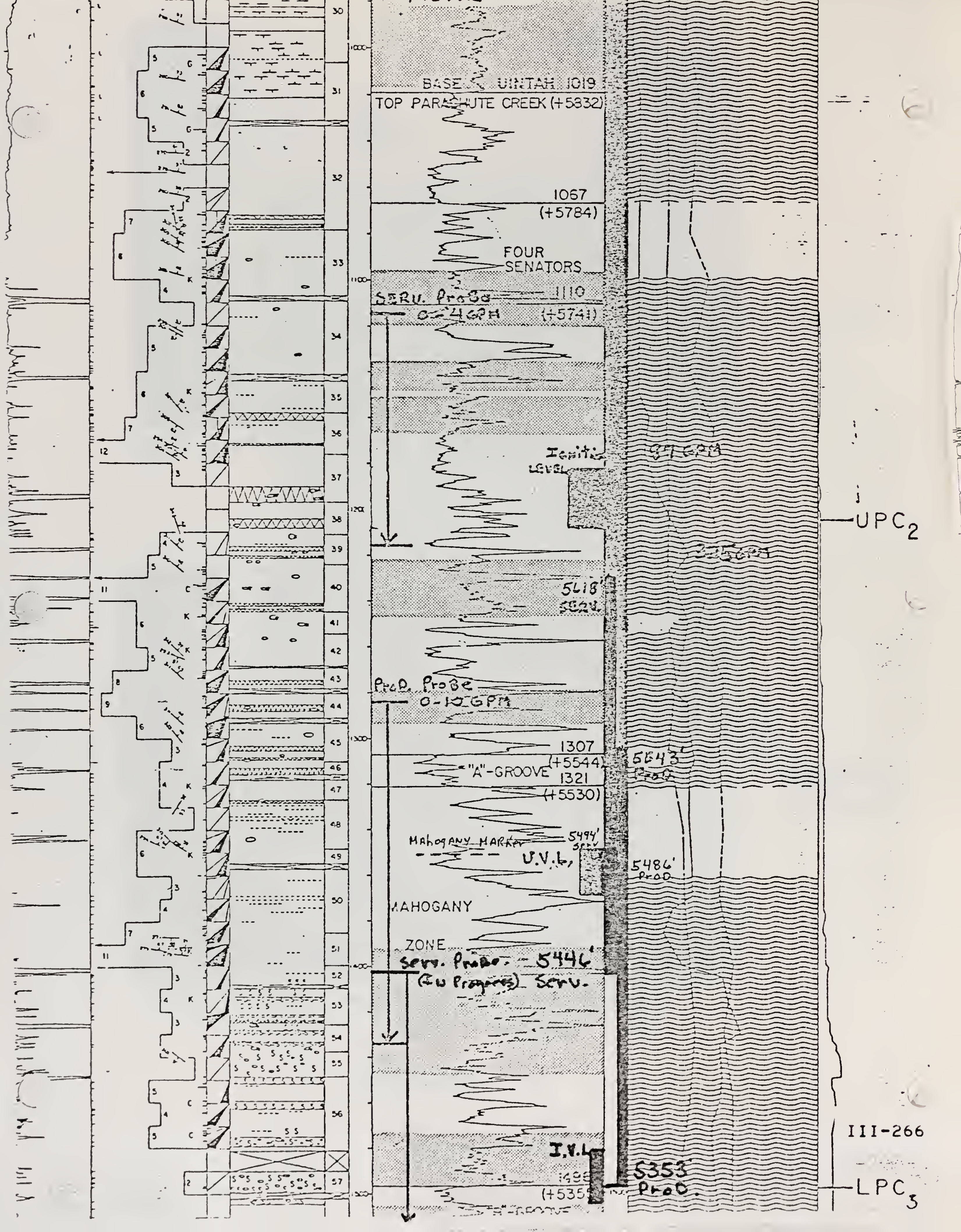


Mahogany Marker

Looking South from intersection on Service Side

Figure 5

Figure 6



BASE UINTAH 1019
TOP PARACHUTE CREEK (+5832)
1067
(+5784)
FOUR SENATORS
Serv. Probe
0-4 GPM
1110
(+5741)
Ignition Level
37 GPM
35 GPM
5618'
Serv.
Prod. Probe
0-10 GPM
1307
(+5544)
"A"-GROOVE
1321
(+5530)
5543'
Prod.
Mahogany Marker
5494'
Serv.
U.V.L.
5486'
Prod.
MAHOGANY
ZONE
Serv. Probe - 5446'
(In Progress) Serv.
I.V.L.
1496
(+5355)
5353
Prod.
"B"-GROOVE
UPC2
LPC3
1000
1100
1200
1300
1400
1500
30
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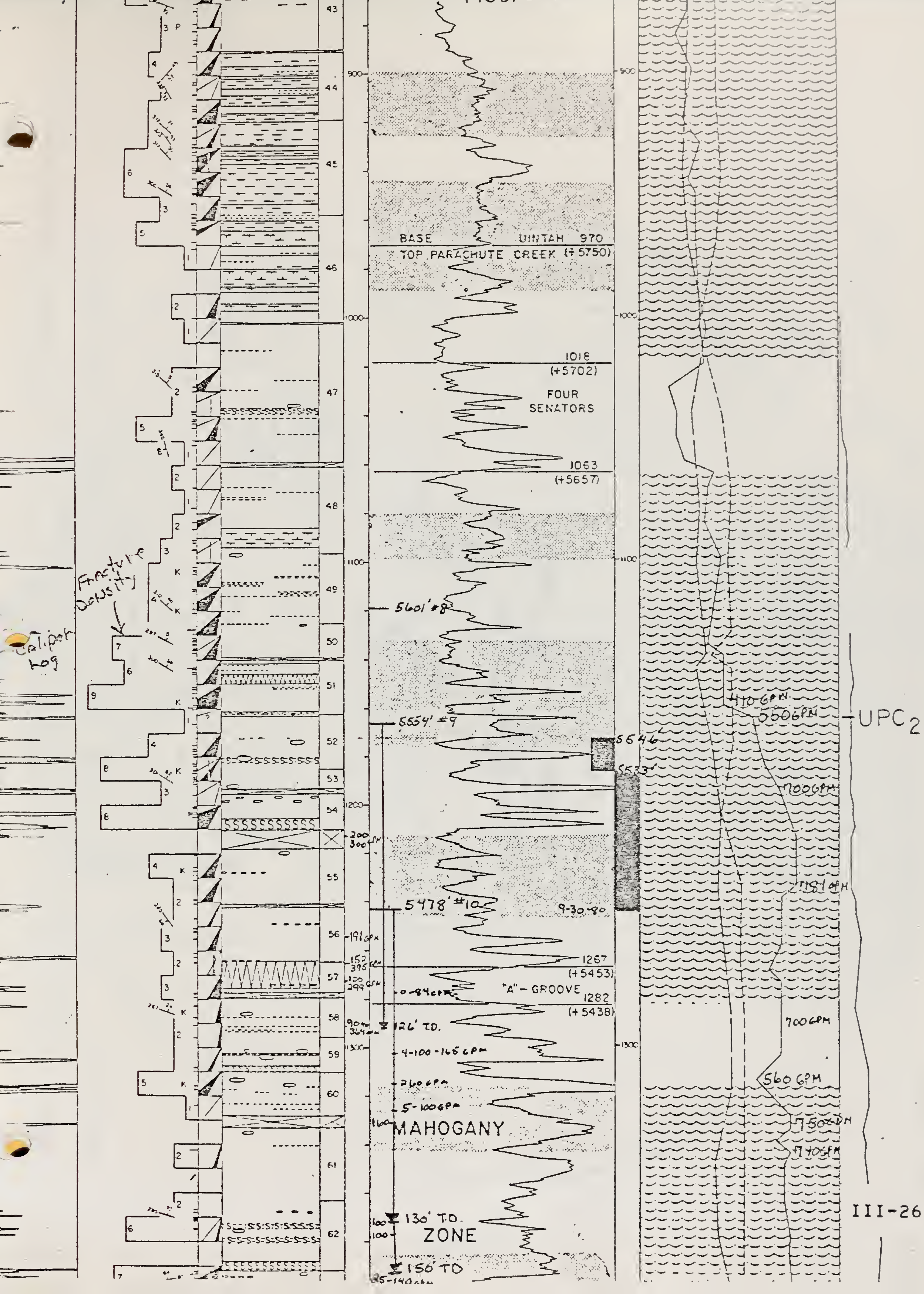
Figure 8



BASE UINTAH 970
TOP PARACHUTE CREEK (+5750)
1018
(+5702)
FOUR SENATORS
1063
(+5657)
5601' #8
5554' #9
5546'
5533'
5478' #10
9-30-80
1267
(+5453)
"A" - GROOVE
1282
(+5438)
126' T.D.
4-100-165 GPM
260 GPM
5-100 GPM
MAHOGANY
130' T.D.
ZONE
150' TD
25-140 GPM
191 GPM
152 GPM
395
100 GPM
299
0-84 GPM
90 to 364 GPM
200
300 GPM
410 GPM
550 GPM
700 GPM
1150 GPM
700 GPM
560 GPM
750 GPM
1140 GPM
UPC2
Fracture Density
Caliper Log
900
1000
1100
1200
1300
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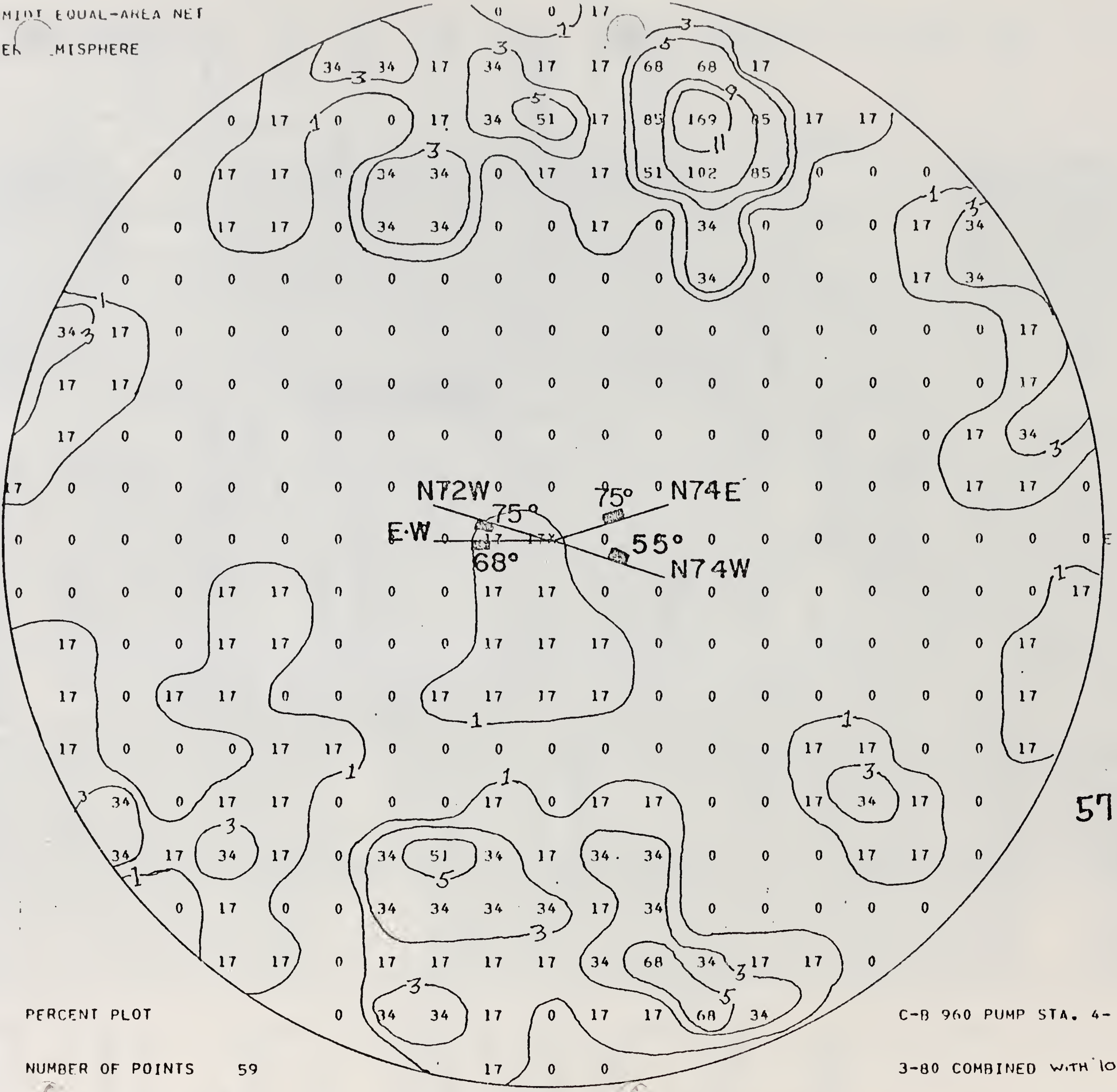
SCHMIDT EQUAL-AREA NET

LOWER HEMISPHERE



5745'-5655'

PERCENT PLOT

NUMBER OF POINTS 59

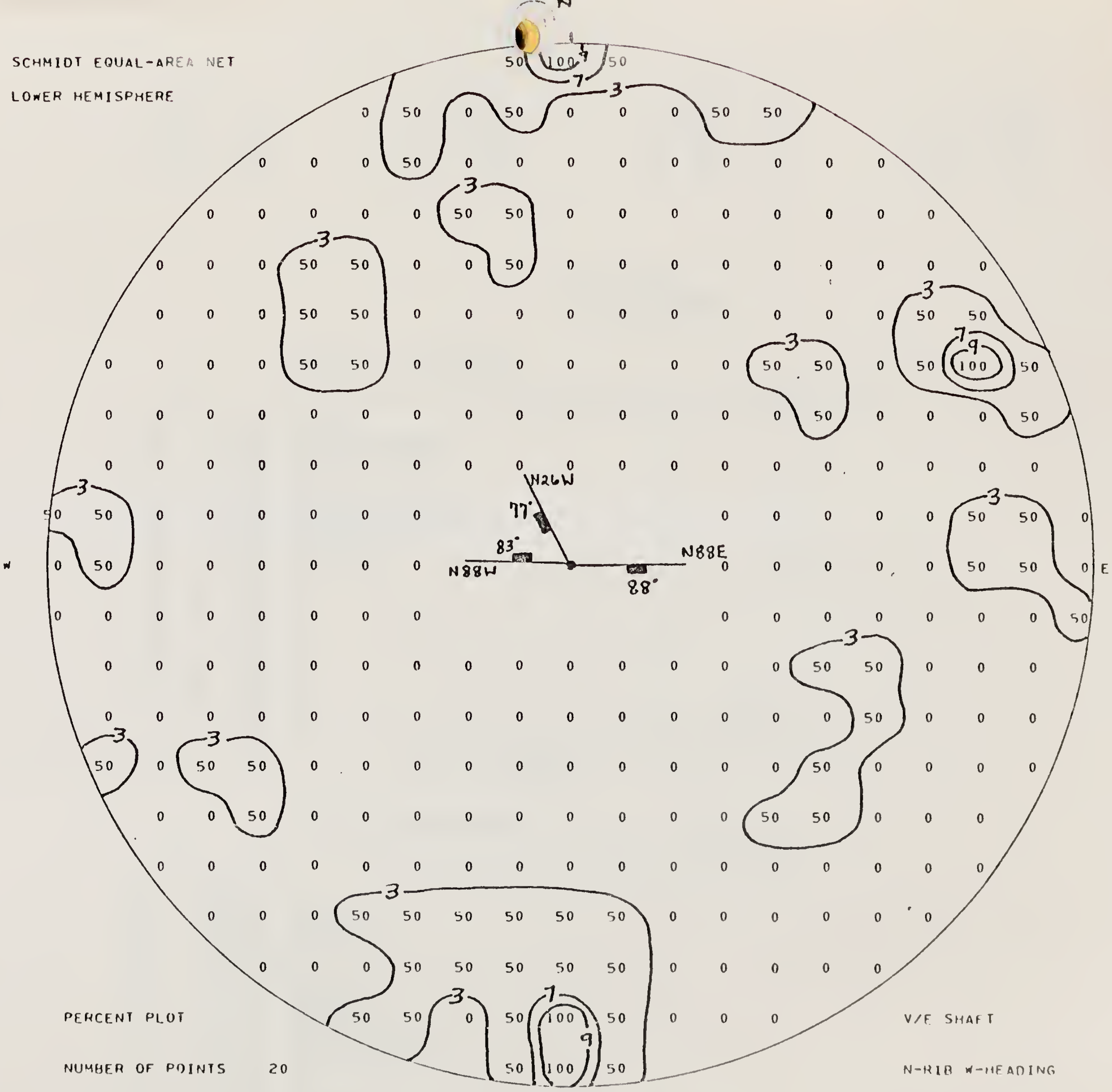
C-B 960 PUMP STA. 4-

3-80 COMBINED WITH 1050' Ignition Level

FIGURE 9

SCHMIDT EQUAL-AREA NET

LOWER HEMISPHERE



PERCENT PLOT

NUMBER OF POINTS 20

V/E SHAFT

N-RIB W-HEADING

New Ignition Level

5534' to 5546'

FIGURE 10

```
                               STRIKE HISTOGRAM
  AZ  NO   PCT
                 +....+....+....+....+....+....+....+....+....+....+
   0   1   5.0   011111
  10   1  10.0   011111
  20   1  15.0   011111
  30   0  15.0   0
  40   1  20.0   011111
  50   2  30.0   01111111111
  60   0  30.0   0
  70   1  35.0   011111
  80   3  50.0   0111111111111111
  90   2  60.0   01111111111
 100   2  70.0   01111111111
 110   1  75.0   011111
 120   1  80.0   011111
 130   0  80.0   0
 140   1  85.0   011111
 150   2  95.0   01111111111
 160   1 100.0   011111
 170   0 100.0   0
 180   0 100.0   0
                 +....+....+....+....+....+....+....+....+....+....+
    TOTAL    20  0    5    10   15   20   25   30   35   40   45   50

                 PERCENT OF OBSERVATIONS


                               DIP    HISTOGRAM
 DIP  NO   PCT
                 +....+....+....+....+....+....+....+....+....+....+
   0   0   0.0   0
   5   0   0.0   0
  10   0   0.0   0
  15   0   0.0   0
  20   0   0.0   0
  25   0   0.0   0
  30   0   0.0   0
  35   0   0.0   0
  40   0   0.0   0
  45   0   0.0   0
  50   2  10.0   01111111111
  55   1  15.0   011111
  60   4  35.0   011111111111111111111
  65   3  50.0   0111111111111111
  70   0  50.0   0
  75   3  65.0   0111111111111111
  80   3  80.0   0111111111111111
  85   3  95.0   0111111111111111
  90   1 100.0   011111
                 +....+....+....+....+....+....+....+....+....+....+
    TOTAL    20  0    5    10   15   20   25   30   35   40   45   50

                 PERCENT OF OBSERVATIONS


                                          V/E SHAFT NEW 1GIN
                                          N-RIB W-HEADING
   STRIKE DIP          STRIKE DIP           STRIKE DIP           STRIKE DIP           STRIKE DIP
 1  225.   58.       6   70.   79.      11   84.   83.      16   50.   60.      21    0.    0.
 2  200.   53.       7  110.   86.      12  295.   67.      17  157.   86.      22    0.    0.
 3  150.   74.       8  325.   64.      13  262.   60.      18  280.   65.      23    0.    0.
 4  275.   88.       9    5.   80.      14   40.   52.      19  270.   73.      24    0.    0.
 5  140.   50.      10  268.   80.      15   80.   59.      20  178.   76.      25    0.    0.
```

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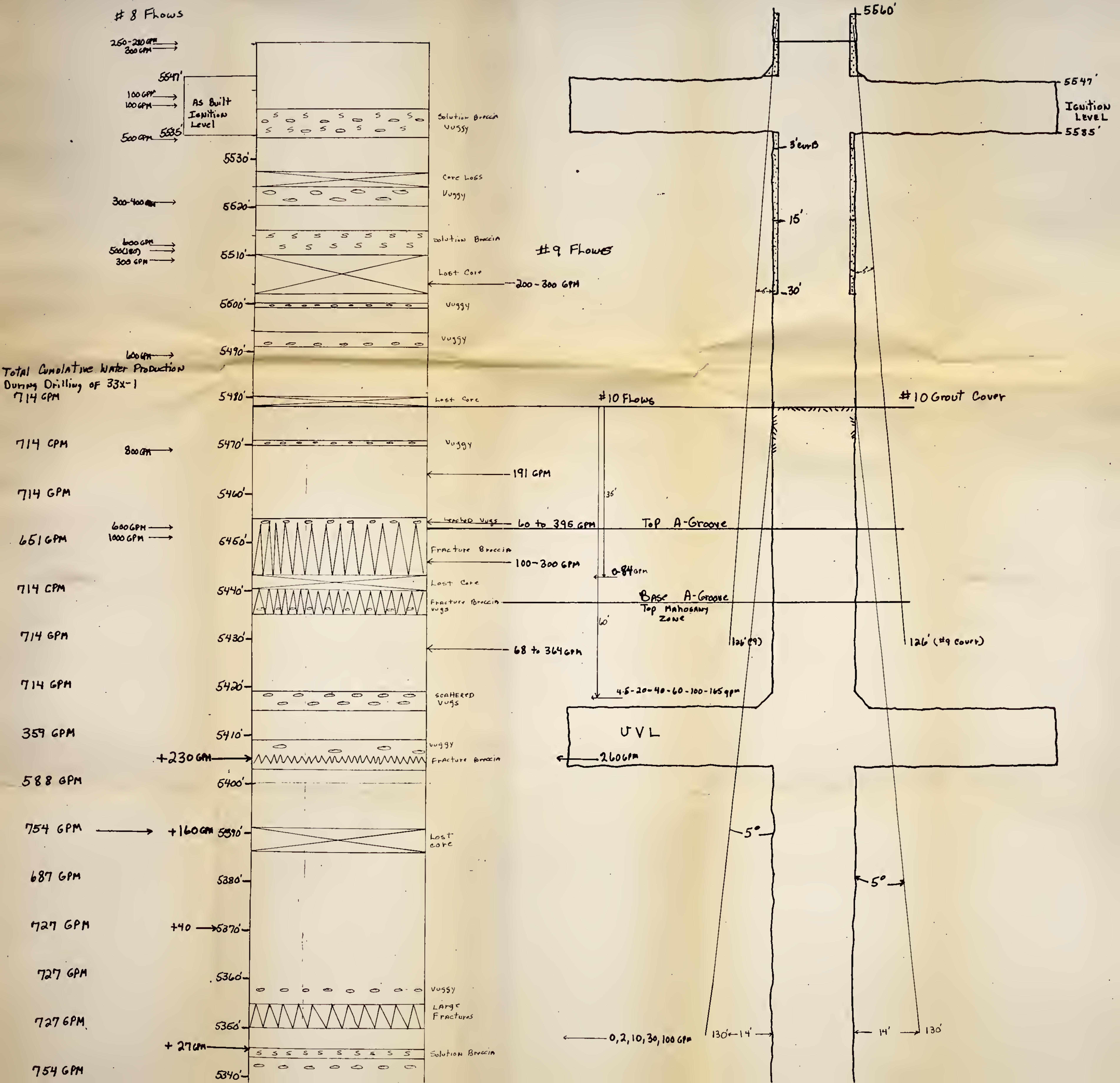
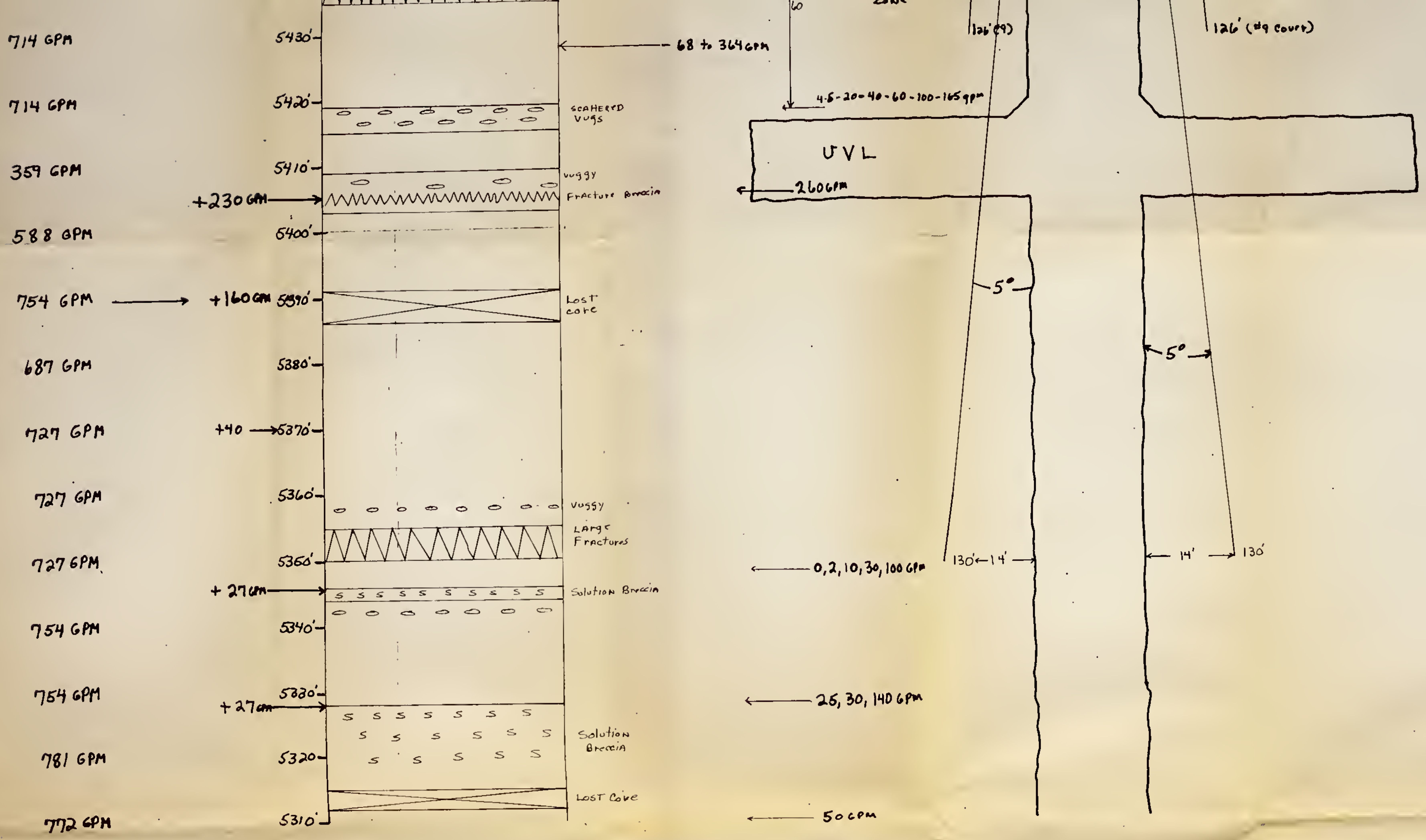


# 8 Flows
250-280 GPM
300 GPM
5547'
100 GPM
100 GPM
As Built Ignition Level
500 GPM
5535'
Solution Breccia
Vuggy
5530'
Core Loss
Vuggy
300-400 GPM
5520'
600 GPM
500(180)
300 GPM
Solution Breccia
5510'
Lost Core
200-300 GPM
#9 Flows
5500'
Vuggy
Vuggy
600 GPM
5490'
Total Cumulative Water Production During Drilling of 33X-1
714 GPM
5480'
Lost Core
#10 Flows
#10 Grout Cover
714 GPM
800 GPM
5470'
Vuggy
191 GPM
714 GPM
5460'
35'
Leached Vugs
60 to 396 GPM
Top A-Groove
600 GPM
1000 GPM
651 GPM
5450'
Fracture Breccia
100-300 GPM
0-84 GPM
Lost Core
714 GPM
5440'
Fracture Breccia
vugs
Base A-Groove
Top Mahogany Zone
60'
714 GPM
5430'
68 to 364 GPM
126' (#9)
126' (#9 cover)
714 GPM
5420'
4.5-20-40-60-100-165 gpm
Scattered Vugs
UVL
359 GPM
5410'
vuggy
+230 GPM
Fracture Breccia
260 GPM
588 GPM
5400'
754 GPM
+160 GPM
5390'
Lost core
5°
687 GPM
5380'
5°
727 GPM
+40
5370'
727 GPM
5360'
Vuggy
Large Fractures
727 GPM
5350'
0,2,10,30,100 GPM
130'
14'
14'
130'
+27 GPM
Solution Breccia
754 GPM
5340'
5560'
Ignition Level
5547'
5585'
3' CMB
15'
30'
5'



Scale 1" = 10'

#10 Grout Cover Geology - Hydrology Log

Suggested Drilling Sequence

(1) 5478 - 5433; 45' Length
(2) 5478 - 5403; 75' Length
(3) 5478 - 5383; 95' Length
(4) 5478 - 5343; 135' Length

Note: Drilling sequences may be changed as conditions warrant

Water zones should be noted during drilling of each sequence.

8/25/80

Figure 11

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